Young substance users : modelling consumption patterns, problems and expectations

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YOUNG SUBSTANCE USERS:
MODELLING CONSUMPTION PATTERNS, PROBLEMS AND EXPECTATIONS

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ABSTRACT

Approximately half of all 16-22 year olds in the United Kingdom have used an illegal drug and substantially more have been in situations where they have declined an offer to use. Against this background there is limited understanding of the processes through which initial use becomes regular or problematic. This thesis explores how a range of factors can influence patterns of substance use in young people. It advances the argument that an individual's perceived reasons (or 'functions') for use can help to explain patterns of drug consumption, problems and future expectations.

Three inter-related studies are described. In study one, salient influences on substance consumption were explored via 40 qualitative interviews with young substance users aged between 16 and 22 years. Study two developed measures to assess key influences identified (including functions and negative effects) and tested an analytic approach to modelling patterns and future expectations for the use of alcohol, cannabis, amphetamines and ecstasy in 100 16-22 year olds. Substance-use function scores were positively associated with frequency of use and future use expectations when peer use and other background variables were controlled. Study three developed this approach further, adding substance-related problem scores as an additional dependent variable. Data on alcohol, cannabis, amphetamines, ecstasy, LSD and cocaine hydrochloride use were collected from 364 young, non-treatment, polydrug users. As well as helping to explain patterns of use, negative mood functions were significantly associated with problems when the effects of peer use and current consumption levels were controlled.

The discussion relates key findings to current prevention, treatment and policy in the substance-misuse field. It argues that adopting a functional approach to studying drug use could increase understanding of the dynamics of substance use in young people, as well as informing practical responses.

CONTENTS

APPENDICES:

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION & LITERATURE REVIEW

1.1 Introduction

Despite continued efforts to control the consumption of psychoactive substances and the associated harms incurred, drug use is common throughout contemporary Britain. It has been calculated that drug use costs England and Wales £3.5 billion each year in social, economic, crime and health-related expenses (United Kingdom Anti-Drugs Coordination Unit (UKADCU), 2000; Healey et al., 1998). Population surveys have indicated a significant increase in the prevalence of drug use in the United Kingdom (UK) during the last two decades, particularly among adolescents[1] and young people[2]. Estimates suggest that around half of all 16-22 year olds have used an illegal drug and substantially more have been offered drugs (Ramsay & Spiller 1997; HEA/BRMB,1997; Balding, 1997, 2000; Parker et al., 1998a; Egginton et al., 2001). Although in many cases this use is experimental and short-lived, it has been suggested that by the age of 18 around a fifth of all young people have become recreational drug users (Breeze et al., 2001). It is likely that a large proportion of these will neither maintain use nor experience drug-related problems (Kandel, 1980; Kaplan, 1988; Bachman et al., 1997; Sloboda, 1998). However, a substantial minority will go on to develop significant social, psychological or health problems that can have lasting consequences. Similar concerns about drug use in young people have been expressed across Europe (European Monitoring Centre for Drugs and Drug Addiction, 1997, 2000; ESPAD, 1997), Australia (Commonwealth Department of Health, 1999) and the United States of America (National Institute on Drug Abuse, 1997). As rates of use are so high in the general population in these countries, predicting who is likely to experiment with illicit drug use is inclined to identify large sections of the population as 'at risk'. More informative are efforts to predict who is likely to develop problems related to their substance use or to explain the mechanisms that underpin transitions from regular to problematic patterns of consumption. In particular, if the ways in which factors interact to influence these processes can be better explained, limited resources could be allocated more effectively to those most likely to need them. Work of this nature could

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[1,2] *These categories are defined in section 1.4.4.*

also help to identify appropriate interventions to reduce the prevalence of problems relating to substance use.

The ways in which a range of factors influence patterns of poly-substance use and related problems in young people are explored in this thesis. In particular, the argument that perceived reasons (or 'functions') for substance use can help to explain drug-related behaviours in young people is proposed. It is important to acknowledge from the outset that drug use is influenced by a complex set or 'web' of inter-related factors. The current research programme examines a section of this 'web' in detail. Improving our understanding of the mechanisms through which specific factors influence patterns of substance use is an important goal for drug research. Piecing together small sections of this complex puzzle could help to inform both prevention and treatment and thus advance efforts to reduce the impact that substance use has on society.

This chapter provides an overview of the background to the research described in this thesis. It begins by establishing why the goal of reducing substance use is important to society. Next, a brief overview of current UK drug policy is presented, followed by a discussion of the terminology used and drug types addressed in the thesis. Section 1.6 reviews the main findings from the relevant research literature including UK drug prevalence data, literature on risk and protective factors, and drug-use correlates. Next, several key influences on drug use that relate closely to the content of the thesis are discussed in detail. These include peer substance use, early onset of use; expectancies and reasons for substance use. Limitations in the literature on reasons and motivations for use are then considered and finally the aims and structure of the thesis are described.

1.2 Background

Substance use is high on the public health agenda for a number of reasons. The existence of 'dependent[1]' drug users raises issues concerning the resources required to treat dependence as well as the losses incurred when chronic users are not productive members of society (Hubbard et al., 1989; Swan, 1998). There are also strong links between dependence on certain drug types (notably heroin and crack cocaine) and acquisitive crimes committed in order to generate the resources required to sustain large

[1] *This term is defined in section 1.3.2*

drug 'habits' (Hough, 1996; Stewart et al., 2000). Furthermore, costs are incurred to society through increased risk of accidents while intoxicated and through work days lost as a result of substance use. For example, Murray & Lopez (1996) estimated that 6.7% of 'disability-adjusted life-years' lost worldwide were caused by substance use (3.5% due to alcohol, 2.6% due to tobacco use and 0.6% due to illicit drugs). A specific section of the population thought to be at particular risk from the negative impacts of substance use is 'young people'. A study conducted in Canada found that alcohol accounted for an overwhelming majority (more than 85%) of the person-years of life lost from early deaths in young people and almost 10% was accounted for by illicit drug use (Xie et al., 1996). There are also concerns that substance use in adolescence and young adulthood may harm career, social and personal development, as well as having negative short-term and long-term health outcomes (Blum, 1987; Shearin & Jones, 1987; Paglia & Room, 1998). For example, substance use has been associated with adverse psychosocial development, poor school performance and high levels of school drop-out (Jessor & Jessor, 1977; Dryfoos, 1990, Brown et al., 1994). Other negative outcomes include the disruption of normal psychosocial functions and anxiety, tension and low self-esteem (Johnson & Kaplan, 1990), as well as disturbed eating and sleeping patterns (Mechanic & Cleary, 1984). Use of drugs and alcohol has also been found to weaken the immune system, making users more vulnerable to illness (Segal & Stewart, 1996).

Of particular concern is evidence that substance-related habits initiated during adolescence are often associated with the development of drug-related problems in adulthood (Hawkins et al., 1992; Donovan et al., 1983; Newcomb & Bentler, 1988a, 1988b; Stacy & Newcomb, 1999). However, the mechanisms behind these relationships are poorly understood (Stacy & Newcomb, 1999). While experimentation with drugs may be viewed by some as typical adolescent behaviour (Peele, 1987) and many users do not seem to develop problems later in life (Newcomb & Bentler, 1989; Shedler & Block, 1990), there is evidence that most adult dependent substance users initiate use during adolescence (Sheehan et al., 1988; Willner, 2000). The mechanisms and processes involved in the initiation and maintenance of substance use has therefore attracted particular attention in research. By focusing on use during this life stage, understanding of how to prevent early use from becoming problematic or dependent in nature could be improved.

1.3 Current UK drug policy

The current approach to drugs in the UK is underpinned by the 1998 Government ten-year anti-drugs strategy, "Tackling Drugs To Build A Better Britain" (UKADCU, 1998). This document details objectives and performance targets for addressing drug issues. In particular, it has identified young people as a priority group for both prevention and intervention activities. The more recent "Second National Plan" (UKADCU, 2000) summarises the following key performance target for this group: "*...to reduce the proportion of people under the age of 25 reporting the use of illegal drugs in the last month and previous year substantially and to reduce the proportion of young people using the drugs which cause the greatest harm – heroin and cocaine - by 25% by 2005 and by 50% by 2008*" (p.15-16). An additional target for 2002 is to: "*...delay the average age of first use of class A[1] drugs by 6 months*" (p.15 – footnote added).

1.3.1 Funding

In order to aid the realisation of these targets, there has been an increase in the resources allocated by Central Government to work in drug prevention and treatment. The most recent Comprehensive Spending Review (CSR 2000) allocated an additional £152 million to education, prevention and treatment services for young people. The prevailing philosophy is to provide an integrated approach between services as detailed in the recent 'Young Peoples Substance Misuse Plan' (UKADCU, 2001). This highlights the aim that by 2004, "*...there will be substance misuse education and information to all young people and their families; advice and support targeted at vulnerable groups; early identification of need; and tailored support to all those who need it when they need it*" (UKADCU, 2001, p.3). The £152 million allocated in the CSR 2000 includes £27.5 million for young people's Tier Four[2] treatment services over three years and £7.5 million for research into the effectiveness of drug education and prevention interventions (UKADCU, 2001).

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[1] *Class A drugs include heroin, cocaine, ecstasy and LSD.*

[2] *Tier Four services are described in table 1.1 on page 6*

1.3.2 Target groups

In the "Young Peoples Substance Misuse Plans: DAT Guidance" (UKADCU, 2001), 'young people' are defined as under 19 years old. However, previous documents have indicated that those under 25 years are included in this group. In particular, much of the Government's drug misuse-related policy has focused on what have been termed 'vulnerable' children or young people, defined as "*a child/young person whose life chances will be jeopardised unless action is taken to meet their needs better and reduce the risk of social exclusion*" (UKADCU, 2001). Specific high risk or 'vulnerable' groups that have been identified in policy documents and elsewhere (e.g. Lloyd, 1998) include:

- children in care,
- school excludees,
- young offenders,
- young homeless people,
- children of drug misusing parents.

It is recognised that group membership is dynamic, with individuals moving in and out of these categories across time. It is also likely that some children and young people will belong to several 'vulnerable groups' at any one time (UKADCU, 2001).

1.3.3 Service provision

The National Drug Strategy places special emphasis on the provision of appropriate services for young people who have, or are at risk of developing, drug-related problems. The expansion of appropriate drug treatment and prevention services for young people, particularly for those under 18 years of age, has been highlighted as a key priority.. The current approach to substance misuse services for children and young people has been influenced by a four-tier system recommended in the Health Advisory Service report (HAS, 1996) (see table 1.1). This report describes how services, interventions and skills for dealing with young people's substance misuse need to be structured through these four tiers.

Table 1.1 HAS (1996) Recommended tiered structure for drug services

Tier One	**Providing:** Drug education; information; identification and referral of young drug users. **Providers:** Generic services, such as education, youth and family services, generally have direct access to young people and are ideally placed to provide front-line interventions. Key professionals include general youth workers, teachers, school nurses, social workers, health visitors and GPs.
Tier Two	**Providing:** All of tier one, plus drug-related education, advice and counselling services. **Providers:** Youth-oriented services are ideally placed to provide a multi-disciplinary approach, have some specialised knowledge of drugs and alcohol and skills in working with young people's problems. Key professionals include youth workers, youth justice workers, educational psychologists and A & E staff.
Tier Three	**Providing:** Young people's specialist drug services and other specialised services that work with complex cases requiring multi-disciplinary team-based work. **Providers:** Key professionals include specialist foster carers, open and secure residential unit workers, substance misuse teams, child and adolescent mental health teams, youth offender teams and young offender institution staff.
Tier Four	**Providing:** Very specialised and intensive forms of intervention for young drug users with complex care needs. Services may include specialist residential services and mental health teams. **Providers:** Staff may include specialist young people's residential workers, child/adolescent and forensic psychiatrists.

Young people who develop drug-related problems may also have an array of other health, social care and criminal justice problems (HAS 1996). The Government has indicated that they support the development of an integrated approach to the assessment and provision of care for young people with multiple risks and problems across services.

1.4 Terminology

As far as possible, the terminology that is currently employed in academic publications within the drug and alcohol field is used in this thesis. This section defines the main terms employed.

1.4.1 Drug

The United Nations International Drug Control Programme's "Terminology and Information on Drugs: revised edition" (UNDCP, 1999a) summarises the usage of the term as follows: *"In medicine, it refers to any substance with the potential to prevent or cure disease or enhance physical or mental welfare: in pharmacology it means any chemical agent that alters the biochemical or physiological processes of tissues or organisms. In the context of international drug control, "drug" means any of the substances in Schedule I and II of the 1961 Convention, whether natural or synthetic"* (p.64). As the scope of this research includes the licit drug alcohol, for simplicity throughout this thesis the term 'drug' will be used to denote both substances which are licit and illicit. The term 'substance' is used interchangeably with 'drug' to designate any compound consumed for its psychoactive effects.

1.4.2 Drug dependence

The World Health Organisation (WHO) abandoned the term 'addiction' more than thirty years ago in favour of 'drug dependence', defined by UNDCP as follows: *"Drug dependence comprises a cluster of physiological, behavioural and cognitive phenomena of variable intensity, in which the use of a psychoactive drug (or drugs) takes on a high priority. It implies a need for repeated doses of the drug to feel good or avoid feeling bad".* (UNDCP, 1999a. p.63). Individuals are generally classified as 'drug dependent' if they meet criteria defined in the WHO's International Classification of Diseases (ICD-10 - WHO, 1992) and/or the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-IV – American Psychiatric Association, 1994). These criteria are summarised in table A1 in appendix A.

It has been suggested that the DSM criteria may not be appropriate for diagnosing abuse and dependence in young people (Newcomb & Richardson 2000; Newcomb, 1995). Adolescents and young people often exhibit signs of 'abuse' for various substances but it is generally accepted that few will show symptoms of

dependence in the form of tolerance or withdrawal (Segal & Stewart, 1996). Instead, signs such as loss of control (e.g. the use of larger amounts or for a longer time than intended) (Martin et al., 1995) and other physical, cognitive and psychological disturbances (Stewart and Brown, 1995) are more commonly observed. Stewart and Brown suggest that the lack of withdrawal symptoms may be explained by the fact that most young drug users tend to use several different substances rather than a single type in isolation. Others have noted that for drugs such as alcohol a person must have been drinking for between six and eight years before a withdrawal syndrome will be evident (Segal, 1990). Consequently, due to the age and likely length of substance use history, only very rarely will a young person reach this threshold (Segal & Stewart, 1996).

1.4.3 Drug use/abuse

Although the term 'abuse' is used in the DSM-IV manual, there is some disagreement regarding its utility. The WHO's review of alcohol and drug terms (WHO, 1994) recommended that the term 'drug abuse' should be abandoned in favour of terms such as 'harmful use' or 'hazardous use' defined as follows:

> Harmful use: *"...a pattern of psychoactive substance use that is causing damage to health. The damage may be physical or mental. Harmful use commonly, but not invariably, has adverse social consequences"*
>
> Hazardous use: *"...a pattern of substance use that increases the risk of harmful consequences for the user... In contrast to harmful use, hazardous use refers to patterns of use that are of public health significance despite the absence of any current disorder in the individual user"(p.41).*

However, the UNDCP still uses the term 'abuse', defining it as: *"The use of any substance under international control outside therapeutic indications, in excessive dose levels, or over an unjustified period of time".* (UNDCP, 1999a, p.62) This definition requires judgements to be made concerning the circumstances under which a controlled drug is being consumed. In order to avoid passing judgement on individual cases in this thesis, the term 'drug use' will refer to all types of psychoactive drug consumption – both licit and illicit. For similar reasons, the judgement-laden term 'misuse' will also be avoided except when citing sources that specifically refer to 'misuse'.

1.4.4 Young people

There is a general lack of consensus over the exact age range covered by the term 'young people'. For example, as mentioned earlier (section 1.3), the National Drug Strategy (UKADCU, 1998) includes all those under 25 years in this category, whereas a more recent document (UKADCU, 2001), defines 'young people' as under 19 years. Meanwhile, the Health Education Authority included those up to the age of 35 in their survey of young people (HEA/BRMB, 1997; Tasker et al., 1999). Some have chosen to use the term 'adolescents' or 'young adults' instead. These terms seem to be more consistent and are usually used to refer to those between the ages of 11 and 18 (or 10 and 19 – Crockett & Peterson, 1993) and 19-25 years respectively (DH/DSS, 1993). The scope of this thesis demands a term that simultaneously covers those in late adolescence and young adulthood. Consequently the term 'young people' has been adopted throughout. The defining boundaries of this category for the purposes of this particular work are 16 and 22 years inclusive. The rationale for this decision is discussed in Chapter Two.

1.5 Classification of drugs

A major problem with research into illicit drug use is the exact composition of drugs that are produced illicitly and sold on the street is unknowable (in contrast to pharmaceutically manufactured drugs which have been diverted into street markets). The Home Office drug-seizure statistics can give an approximate idea of average purity levels and compositions but these are likely to fluctuate by area and over time. For the purposes of this thesis, the beliefs of the young people interviewed have been taken to indicate the type of drug which they have been using as well as the quantity consumed.

Drugs are commonly classified according to the type of effects that they produce in the user. The WHO has classified psychoactive drugs in five categories: sedative/ hypnotics (central nervous system depressants, such as alcohol, diazepam or temazepam etc.), behavioural stimulants and convulsants (e.g. amphetamines, MDMA, cocaine hydrochloride etc.), narcotic analgesics (e.g. opiates, such as diamorphine or codeine), (iv) antipsychotic agents (e.g. chlorpromazine, haloperidol etc.), and (v) psychadelics and hallucinogens (e.g. LSD, PCP etc.) (Kolb and Wishaw, 1989). The substances discussed in this thesis are those which are most prevalent among young people in the UK today (Ramsay & Partridge, 1999) and are briefly described below.

1.5.1 Alcohol

Alcohol, or 'ethanol', can be classified in the 'sedative/hypnotic' category. In the UK, alcohol can be purchased by adults (i.e. those aged 18 years and above) at licensed premises and it is legal for children (over 5 years old) to drink alcohol outside a bar or public house (Institute for the Study of Drug Dependence (ISDD), 1996). A variety of strengths are commonly available, ranging from low alcohol beverages (commonly less than 3% alcohol by volume, a.b.v.) to spirits (approximately 40% a.b.v.).

1.5.2 Amphetamines

Although there are numerous amphetamine-type compounds, for the purposes of this thesis, the term 'amphetamines' is used to denote any drug purchased in the UK as 'speed'. At the time of writing, the compound most commonly sold as illicit amphetamine in the UK was amphetamine sulphate. Reports from the Forensic Science Service laboratories have estimated that the average purity of amphetamine sulphate sold at street level in the UK fluctuates between 5% and 18% (Corkery, 1998; DrugScope, 2000). Amphetamine sulphate is commonly ingested intra-nasally by 'snorting', though some young people may swallow the drug. A small proportion may use this drug by injection, but in the UK this practice is relatively uncommon within the target age group.

1.5.3 Ecstasy

The term 'ecstasy' has been coined as slang for 3,4 Methylenedioxymethamphetamine (MDMA), but it is well known that pills sold as 'ecstasy' often contain a cocktail of drugs, sometimes lacking any MDMA (ISDD, 1996). However, for the purposes of this research, the term 'ecstasy' is used as an umbrella term to denote all tablets (or powders) that the consumer has purchased as 'ecstasy' or believing to contain MDMA. Ecstasy is often described as a 'hallucinogenic amphetamine' as its effects encompass those common to both hallucinogens and amphetamines. Recent data from the Forensic Science Service suggest that tablets sold as ecstasy in the UK between 1996 and 1999 contained an average of approximately 80mg of MDMA (DrugScope, 2000). Ecstasy is usually ingested orally, although the drug is sometimes snorted and occasionally injected.

1.5.4 Cocaine

Throughout this thesis the term 'cocaine' is used to denote the powdered salt form of the drug derived from the Coca plant (any species of the genus *Erythroxylon*) also known as 'cocaine hydrochloride'. The term is not intended to refer to the base form of cocaine ('crack cocaine'). In the UK, cocaine is most commonly snorted, but can also be smoked or injected. The average purity of cocaine hydrochloride at street level is estimated to be 50% (Corkery, 1998; ISDD, 2000).

1.5.5 LSD

D-Lysergic Acid Diethylamide (or LSD),is a semi-synthetic hallucinogen. It is commonly sold impregnated on small paper squares, in mini tablets or gelatine sheets. The average dose is reported to range from 25-200 micrograms (UNDCP, 1999a). LSD is consumed orally.

1.5.6 Cannabis

Cannabis is often classified as a drug that alters perceptual function (ISDD, 1996) alongside LSD and other hallucinogens, although there is some dispute as to whether or not it is a true hallucinogen.

The term 'cannabis' is used to denote any products from the plant *Cannabis Sativa* which are ingested for intoxicating purposes. The drug exists in a number of forms: the dried buds or leaves from the plant (often referred to as 'marijuana' or 'grass'); the dried brown or black resin secreted by the flowering tops of the plant ('hash' or 'hashish'), and cannabis oil – a dark, tar-like, viscous oil that is extracted from cannabis resin. The consumption of all forms of cannabis is usually by smoking, with or without tobacco. Cannabis can also be eaten.

1.5.7 Polydrug use

The observation that it is not uncommon for drug users of all ages to use more than one different substance type is now widely accepted (e.g. Clayton & Ritter, 1985; Martin et al., 1992; Newcomb & Bentler, 1988a, 1988b; Newcomb, 1992; Grant & Hartford, 1990). For the purposes of this thesis, a distinction has been made between the terms 'polydrug use' and 'concurrent drug use'. Polydrug use is used to refer to the use of several different drugs over a short period of time (e.g. three months); concurrent use describes the use of two or more so that their effects are experienced simultaneously

(Boys et al., 2001b) and has also been described as 'simultaneous use' (Grant & Hartford, 1990; Earleywine & Newcomb, 1997).

1.6 The research base

This section provides an overview of the research literature on young people and substance use. It begins by summarising current data on the prevalence of drug use in the UK. This is followed by an overview of the range of factors that studies have shown to be linked to drug use.

1.6.1 Prevalence estimations

The illegal nature of drug use makes estimating the extent of use in the general population extremely difficult, as individuals may be reluctant to admit to use. A range of data sources exist that can help to estimate the prevalence of illicit drug use in the UK. These can be categorised as official data sources, population surveys, university surveys and school surveys. Official data sources include police figures for drug seizures and drug-related crimes and the Department of Health's (DH) drug misuse statistics. These are useful indicators of drug-use trends and related problems across the country. These data can help to identify regional differences as well as changes in purity and availability of certain drug types. However, drug seizures and drug-related crimes only represent the tip of the iceberg, as most users never come into contact with the legal system. Similarly, the DH statistics only record details of people who have accessed drug-related health services. Consequently, neither of these sources are able to indicate the overall prevalence of drug use in society as it is likely that many drug users never actively seek help relating to their substance use from medical or social services or come into contact with the criminal justice system.

Surveys are likely to provide a more realistic picture of the national prevalence of drug use. There are generally three types of survey that gather this type of information: general population surveys, university surveys and school surveys. In the UK, there are no dedicated drug-use surveys at the general population level that are conducted on a regular basis in order to monitor changes in drug-use prevalence. The British Crime Survey, conducted every two years by the Home Office, includes a drug-use component from which estimates regarding use in the general population can be extrapolated. However, despite the large sample size obtained for the most recent

survey (n=9,988), the number of young people surveyed is relatively small (n=502 aged 16-19) (Ramsay & Partridge, 1999) and so the extent to which this can provide a true national picture is limited. Studies that have aimed to assess the prevalence of substance use specifically among adolescents and young people have tended to draw samples from university populations (e.g. Wright & Pearl, 1986, 1990; Ashton & Kamali, 1995; Webb et al., 1998) or schools (e.g. Miller & Plant, 1996; Balding, 1997, 1998, 2000; O'Connor et al., 1998; Goddard & Higgins, 1999; Sutherland & Sheppard, 2000). While valuable, such surveys are subject to biases as they exclude those outside mainstream education and persistent truants. Furthermore, after the age of 16, young people who are in the employment market or looking for work are also excluded. This weakness has been addressed in a number of one-off surveys that have examined substance use in random samples of young people from the general population (e.g. HEA/BRMB, 1997; Tasker et al., 1999).

Overall, the picture derived from these sources suggests that substance use among young people is widespread in the UK and has increased considerably during last decade. The most recent British Crime Survey (BCS) reported that 40% of 16-19 year olds and 47% of 20-24 year olds had ever used cannabis (Ramsay & Partridge, 1999). Other commonly consumed drugs included amphetamines (used by 18% of 16-19 year olds and 24% of 20-24 year olds); LSD (10% and 13% respectively) and ecstasy (8% and 12%). In contrast, the prevalence of cocaine use was 3% for 16-19 year olds and 9% for 20-24 year olds, while use of heroin was reported by 1% or less of people aged 16-24 years. These findings are similar to those reported elsewhere (e.g. Ramsay & Spiller, 1997; HEA/BRMB, 1997; Tasker et al., 1999; Miller & Plant, 1996; Balding, 1997, 1998, 2000). Overall, these data trends are generally comparable with estimates from other European countries (European Monitoring Centre for Drugs and Drug Addiction, 1997; 2000) and the USA (Johnston et al., 1997).

Other surveys examining drug use among young people have used purposive samples (Spooner & Flaherty, 1992) rather than taking random samples from a given age group. One example of such a survey is the "Release Drugs and Dance Survey" (Release, 1997). In this study over 500 young people were interviewed at nightclubs and other dance events. Given the close association between dance events and illicit drug use, particularly over the past decade, as would be expected, higher levels of drug use than national norms were reported. Nevertheless, the hierarchy of drugs used was very similar to the population studies mentioned above: cannabis was most prevalent,

followed by the 'dance drugs' (amphetamines, ecstasy and LSD) and then cocaine. Lifetime use of heroin was significantly less common. Similar findings have been reported by studies based elsewhere in the UK (e.g. Forsyth, 1996; Measham et al., 2001).

While a useful source of data regarding trends in substance use over time, prevalence studies generally only record whether or not use has taken place during a specified time period (most commonly lifetime, past 12 months and past 30 days). These data indicate the extent of use in a population, but provide no information regarding the nature of that use. For example, in the BCS, no distinction is made between a daily cannabis smoker and someone who has tried it for the first time during the past month. Similarly, drug-use surveys provide little insight into the aetiology of the behaviour or how best to address the problem. It is therefore important to conduct more in-depth studies of drug use to complement the population-level surveys for three main reasons. Firstly, by studying the process of initiation into drug use and the factors which influence continued use, we can be better equipped to develop interventions to stop use or to prevent initiation. Secondly, increasing our understanding of the dynamics and reasons for drug use could enable the design and provision of useful information in order to facilitate informed choices about substance use. Thirdly, by increasing our understanding of how drug-related problems develop and the factors that best predict problematic use, this can help us to target resources and to improve treatment. The next section in this chapter develops these themes and examines the current literature on the aetiology and predictors of substance use.

1.6.2 Explaining substance use

Considerable effort has been invested in the identification of characteristics that can distinguish which of a population of adolescents are likely to initiate substance use and, more importantly, which of the initiators may go on to develop problems or dependence. A large body of literature now exists on what have been termed 'risk' and 'protective' factors. Mrazek and Haggerty (1994) defined risk factors as "*...characteristics, variables or hazards that, if present for a given individual, make it more likely that this individual, rather than someone selected at random from the general population, will develop a disorder*" (Mrazek & Haggerty, 1994, p.6). Protective factors are associated with a reduced likelihood of the disorder. They have been described as factors which moderate or 'buffer' the association between risk

factors and drug use, making an individual more resistent or 'resilient' to the risk (Rutter, 1987, 1993; Clayton, 1992; Newcomb & Felix-Ortiz, 1992; Dunst & Trivette, 1994). While sometimes the direct opposite of a risk factor (e.g. low self-esteem has been described as a 'risk' factor and high self-esteem as 'protective'), protective factors can also be independent (see table 1.2). Research during the past three decades has resulted in the identification of a long list of 'risk' and 'protective' factors. A systematic review of this literature is beyond the scope of this thesis. Instead the table has been included to give the reader an overview of the main risk and protective factors that have been identified in the literature. (For a more comprehensive review the reader is directed to Kandel et al., 1986; Rutter, 1990; Hawkins et al., 1992, 1995; Newcomb, 1995 and Spooner et al., 2001).

Despite changing behavioural norms over the past 30-40 years, the literature suggests that risk factors have largely remained stable and are consequently appropriate targets for preventive work (Hawkins et al., 1992). Prevention approaches based on this research seek to reduce or eliminate risk factors and thus prevent drug use from occurring. While not all factors are likely to be open to manipulation (e.g. specific genes), a growing body of research suggests that many can be modified by external interventions (Reiss & Price, 1996). Protective factors have been heralded as an equally important focus for prevention (Hawkins et al., 1992). Efforts to enhance protective factors could help to reduce harms from drug use in individuals identified as being at particular 'risk'. However, as yet, the research base is insufficient to predict which risk factors are most promising for prevention interventions. Experimental studies are needed to ascertain which of the numerous risk factors are causally related to substance use, and which are most virulent and therefore merit greater focus from prevention efforts. This type of approach has its roots in the medical literature where similar strategies have shown success in reducing risk factors for health problems such as heart and lung disease (Bush et al., 1989; Vartianinen et al., 1990).

Table 1.2 Examples of risk and protective factors for substance use in young people that have been identified in the literature

Category	*Risk factors*	*Protective factors*
Environmental/ social	▪ High drug availability ▪ Low socio-economic status ▪ Drug-using peers ▪ Delinquent peers	▪ Prosocial adult friends ▪ Prosocial peers ▪ High socio-economic status
Family factors	▪ Parental substance use and deviance ▪ Low parental monitoring ▪ Parental rejection ▪ Poor disciplinary practices ▪ Family conflict/divorce ▪ Low parental expectations ▪ Family disruption, including, unemployment	▪ Absence of early loss or separation ▪ Cohesive family unit ▪ Parent-child attachment ▪ High parental supervision and monitoring
Individual biography	▪ Early onset of deviant behaviour, smoking, drinking, drug use ▪ Early sexual involvement ▪ Early onset of illicit drug use ▪ Rapid escalation in substance use ▪ Positive expectations and knowledge about substance use ▪ History of behaviour problems	▪ Late onset of deviant or substance using behaviours ▪ Negative expectations and cognitions about substance use ▪ Religious involvement
Personality	▪ Strain/stress ▪ Sensation seeking ▪ Impulsivity/hyperactivity ▪ Antisocial personality ▪	▪ High self-esteem ▪ Low impulsivity ▪ Easy temperament
Educational	▪ Poor school performance ▪ Low educational aspirations ▪ Absence, truancy and drop-out ▪ Little formal support	▪ Good teacher relations ▪ High education aspirations ▪ High parental education expectations ▪ High education attainment ▪ Good formal support in education

Source: Marsden et al., 2000

The majority of the literature on risk and protective factors has come from North America. In contrast to the findings described above, the results from a recent, large UK-based study suggest that it is not possible to distinguish non-users from users on the basis of a 'risk profile' (Egginton et al., 2001). Parker and colleagues analysed more than 40 previously identified risk factors in a sample of 2293 adolescents and found very few significant differences between different categories of drug users and non-

users except among the small proportion who were extremely drug involved (Parker & Aldridge, 1998 cited in Egginton, et al., 2001). They concluded that this was unsurprising, given the high prevalence of drug trying within this age group.

Overall, a number of general conclusions can be drawn from the risk factor literature. First of all, it is unlikely that there is a single cause of substance use per se, but a whole range of factors that differ by substance type and extent of use, as well as between different cultures and environments. Secondly, specific risk factors involved differ at different life stages: childhood factors related to substance use in adolescence will differ from adolescent factors that predict drug use in young adulthood (Newcomb, 1997). Thirdly, the more risk factors an individual is exposed to, the greater the probability that the behaviour or problem will occur (Bry et al., 1982; Newcomb et al., 1986; Rutter, 1987, 1990). However, the effects of several risk factors co-occurring are not purely additive, instead risk factors appear to interact (Thornberry, 1994) and may be moderated by the presence of protective factors. Fourth, there is significant overlap between risk factors for drug use and risk factors associated with other adolescent problem behaviours (Hawkins et al., 1988). Finally, evidence from the UK suggests that risk factors may be more helpful in profiling people at the extreme end of the drug-using continuum, who are likely to become problem drug users, rather than those 'at risk' of initiating illicit drug use (Parker et al., 2001; Egginton, et al., 2001).

Instead of trying to identify crucial factors that appear to lead to drug use, a general multiple pathway model is now widely accepted. Researchers have begun to try to unravel the inter-relationships between different risk and protective factors and the ways in which they relate to outcome variables. These relationships are generally described in four ways: (i) Risk factors can be simple markers of risk or (ii) may be involved directly or (iii) as mediators or (iv) as moderators in the actual processes through which an outcome occurs (Pandina, 1996). A 'direct' effect occurs when a particular variable influences the outcome variable without the involvement of any other factors which carry (or mediate) the effect. For example, personality variables have been shown to have a direct effect on problems and adverse consequences related to substance use over and above consumption levels (Sadava, 1985; Thomas, 1997). Many of the risk factors identified in the literature are thought to have an indirect effect on the development of problems in adulthood. In other words, the relationship between the risk factor variable and the outcome is mediated by another variable. For example, Stacy & Newcomb (1999) found that polydrug use mediated the effect of social

conformity on drug problems. Dishion et al., (1999) reported that the influence of contextual risk factors (such as parent substance use, stress and low socio-economic status) on substance use was mediated by family and peer socialization influences. Where drug consumption has been shown to have a greater influence on the development of problems in individuals with higher scores on certain dimensions of risk or susceptibility, the relationship is said to be 'moderated' (e.g. Donovan et al, 1983; Sher, 1991; Stacy et al., 1991a; Stacy & Newcomb, 1999). For example, depression has been shown to moderate the relationship between alcohol consumption levels and problems in women (Stacy et al., 1991a). Other factors thought to have a moderating effect on the effects of drug consumption on problems include personality traits such as sensation seeking (Stacy et al., 1991a, Stacy & Newcomb, 1999) and drug problems in parents (Sher, 1991). A major challenge for substance-use research is therefore to identify the mechanisms involved in how risk and protective factors interact in influencing drug-related behaviours in young people.

1.6.2.1 Limitations

Although the risk and protective factor literature has enhanced general understanding about vulnerability and resilience to drug use, there are a number of limitations that should be considered. For example, confusion has arisen from a lack of consistency in how certain terms are defined or measured. For example, much of the research from North America has been obliged politically to define all drug use as 'abuse' (Newcomb, 1995). Furthermore, there has been a tendency for reviews of the literature to ignore distinctions between risk factors related to 'use', 'abuse' and 'problems or dependence' (e.g. Hawkins et al., 1992), despite evidence that differences exist.

A large proportion of the literature is based on research that has identified factors related to tobacco, alcohol and cannabis use among young people. Studies that have identified risk factors associated with use of other drugs (such as LSD, ecstasy or cocaine) are in a minority. The direct relevance of this research base for informing prevention programmes targeting drugs such as cocaine and heroin is therefore uncertain.

A further limitation is that although these studies have played a valuable role in helping us to understand who is likely to fall into certain categories of drug-related risk, they tend to regard the individual as relatively passive and thus provide little help in understanding how and why such transitions occur. In particular, there is little

provision made for active cognitive factors i.e. how the young person processes the experience of these risk factors. These are addressed in the next section.

1.6.3 Intrapersonal factors

Unlike other psychiatric and medical diagnoses, drug dependence results from a complex interaction between external environmental and intrapersonal factors: in general a drug has to be available and the individual has to decide to use it. In the absence of these circumstances there can be no dependence (Newcomb, 1995; Newcomb & Earleywine, 1996). Intrapersonal factors are likely to be important influences on the initiation of drug use, the transition to regular use and the transition to dependent or problematic use. Consequently, these factors are therefore also likely to be appropriate targets for efforts to prevent these transitions (Glantz & Pickens, 1992; Hawkins et al., 1992; Newcomb & Earleywine, 1996). In addition to risk and protective factors, the literature also identifies a considerable number of possible causes and correlates of drug consumption behaviours (see Prendergast, 1994; Newcomb, 1997; Spooner et al., 2001 for reviews). In contrast to a risk factor, a 'correlate' of drug use has been defined as a factor which co-exists with (rather than precedes) use (Swadi, 1999).

Newcomb & Earleywine (1996) suggest that the literature on intrapersonal factors which influence decisions regarding drug-related behaviours can be conceptualised using seven broad categories: i) personality, ii) cognitions, iii) affect, iv) behaviour, v) biogenetics, vi) demographics and vii) bonding. Although these are not distinct categories and there will be a certain amount of interaction between them, they are used to structure the following sections of this chapter. This is followed by a more detailed examination of some key factors that are particularly relevant to the research described in this thesis.

i) Personality

Although the existence of an 'addictive personality' has been largely rejected due to insufficient evidence (Nathan, 1988), there is a substantial body of literature that supports links between certain personality traits and substance use and related problems (Stacy et al., 1991a; Thomas, 1997; Block & Block, 1988). Khantzian (1985) suggested that decisions concerning psychoactive substance use are based on an interaction between the perceived effects of the drug and the personality traits of an individual. It

has also been suggested that individuals who initiate illicit drug use at an early age may differ on important personality dimensions from those with later onset of use (e.g. Gersick et al., 1981). A considerable body of research has found evidence relating personality characteristics such as sensation seeking and impulsivity to onset, escalation and development of problems relating to substance use (e.g. Teichman, et al., 1989; Kandel, 1980; Allsopp, 1986; Henderson, et al., 1998).

ii) Cognitions

A relationship between a variety of cognitive factors and substance use has formed the basis of much investigation during the past two decades. In particular substance-related 'expectancies' and 'motivations or reasons' for drug use have been studied extensively within the alcohol and drug literatures. Research on expectancies has focused on how the set of beliefs that people hold regarding the impact of a substance on mood, emotions and behaviour interacts with consumption patterns and intentions. Expectancies have been shown to relate to future use, current use and problems (e.g. Brown, 1985; Stacy et al., 1990; Wood et al., 1992; Werner et al., 1993; Oei & Baldwin, 1994) in a range of populations.

It has been argued that expectancies and motivations for substance use are the most proximal (or immediate) factors that influence behaviour (Stacy et al., 1995) and that these variables mediate the impact of other more distal factors on drug consumption. For example, Sher and colleagues (Sher et al., 1991) found that alcohol expectancies mediated the relationship between family alcoholism and alcohol consumption patterns. The research addressing these constructs is examined in more detail in section 1.7.5.

iii) Affect/mood/emotion

As psychoactive drugs often have a strong effect on the user's mood, it is perhaps unsurprising that an individual's current mood state has been shown to influence decisions regarding use. A number of studies have examined the link between negative affect and patterns of use. For example, Kaplan (1985, 1987) noted associations between anxiety, depression and negative feelings towards the self and drug use. However, the direction of influence is unclear. While it is possible that negative mood state precedes the decision to use a drug, it could result from short-term use (due to after-effects or withdrawal) or long-term use (Newcomb & Bentler, 1988a). There is

also evidence that negative affect may interact with other intrapersonal variables such as expectancies. For example, Kushner et al., (1994) found that anxiety was related to alcohol consumption only in men who expected alcohol to relieve tension. In contrast, studies that have examined the relationship between positive affect and consumption are less common (Newcomb, & Earleywine, 1996).

iv) Behaviour

A substantial body of literature has noted a significant degree of commonality between risk factors for crime, conduct disorders and other 'problem behaviours' such as substance use. Several research groups have argued that the close relationships between these types of antisocial behaviours suggest the existence of a single 'problem behaviour construct' (eg Donovan et al., 1988; Metzler et al., 1995; Kumpfer et al., 1998; Ary et al., 1999). However, substance use has increased during the past two decades to the point where the majority of experimental drug use can no longer be described as 'deviant' behaviour, as most who engage in it are not on the margins of society. Parker and colleagues have described this process as 'normalization' (Parker et al., 1995, 1998a, Measham et al., 1998; Parker, 2001). In fact, some researchers have suggested that experimental drug use is developmentally appropriate (Newcomb & Bentler, 1988a; Shedler & Block, 1990). For example, Shedler & Block found that individuals who had experimented with drugs were better psychologically adjusted than either frequent users or abstainers (Shedler & Block, 1990). Similar findings have been noted in relation to alcohol use (Jones, 1968, 1971). Others have interpreted substance use as a symptom of adolescent-limited delinquency – a phase characterised by numerous non-conforming behaviours that peaks around 17 years and disappears as an individual develops into adulthood (Moffit, 1997). It therefore seems that the relationship between substance use and other 'problem' behaviour variables is likely to be more complex than some have previously thought, as drug use becomes more widely acceptable and accessible.

v) Biogenetics

There is evidence that genetics play a role in determining patterns of substance use over and above the role of modelling in families (Cloninger, et al., 1981). Genes may effect how the body responds to a drug and this experience will have an impact on future decisions to use. For example, there is evidence that offspring of alcoholics may be less

sensitive to the intoxicating effects of alcohol (Pollock, 1992; Schuckit, 1994). However, there is also thought to be a genetic component to aspects of temperament and personality that also effect substance-related decisions, as discussed earlier in this section.

vi) Demographics

Gender differences in consumption measures have been widely documented (HEA/MORI 1992; Measham et al., 1994; Johnston et al. 1994; Mott & Mirrlees-Black, 1995; HEA/BRMB, 1997; Ramsay & Partridge, 1999) although some studies have suggested in recent years that at least among adolescents, the gender gap has reduced (Parker et al., 1995, 1998; Balding, 1997; 2000; Egginton et al., 2001). There is evidence that other factors related to substance use (such as reasons and expectancies) may be moderated by gender (e.g. Snow & Wells-Parker, 1986; Windle & Barnes, 1988; Sher et al., 1991; Billingham et al., 1993; Dunne et al., 1993; Beck et al., 1995). For example, Hammer & Pape (1997) reported a relationship between low self-esteem and alcohol problems in males. It has also been suggested that young females may be more anxious to 'stay in control' of themselves when engaging in substance use than their male counterparts (Hart & Hunt, 1997; McCallum et al., 1998).

A strong relationship between age and drug use has also been widely documented. Data from national surveys have indicated that drug use peaks between the ages of 16 and 24 and then rapidly declines as adulthood progresses (HEA/BRMB, 1996; Tasker et al., 1999; Ramsay & Partridge, 1999). Age appears to interact with factors such as parental influence (Andrews et al., 1993) and reasons for use (e.g. Newcomb et al., 1988; Novacek et al., 1991), moderating their influence on consumption patterns. There is also evidence that other demographics such as ethnicity and occupation are related to the decisions that people make regarding substance use (e.g. Hammer, 1992; Maddahian et al., 1988; Wallace & Bachman, 1991). For example, Hammer & Vaglum (1990) reported a positive relationship between unemployment and alcohol and cannabis consumption in men.

Although most demographic variables cannot be modified, their role in predicting drug consumption patterns may still have important implications for interventions. Research could help us to identify what type of approaches might be more suitable for different demographic groups. For example, efforts to increase self-esteem might be more appropriate in interventions which target male alcohol users.

vii) Bonding

Studies have shown that strong bonds with religious organisations, schools and the family can all act as protective factors, increasing resilience to risk factors for drug use (e.g. Buckhalt et al., 1992; Simons-Morton et al., 1999). In contrast, the absence of such bonds has been associated with greater drug involvement (e.g. Johnston et al., 1985; Jessor et al. 1986; Catalano et al., 1996). A few studies have suggested that gender may interact with the influence exerted by bonding to moderate its effect. For example, Ensminger and colleagues (1984) found that family bonds had a protective effect against substance use in females only. There is also evidence that the type of individuals with whom bonds are formed can exert an important influence on behaviour. For example, strong bonds with substance-using parents can increase the chances of use, as can bonds with drug-using peers (Jensen & Brownfield, 1983; Gossop et al., 1994). Catalano et al., (1996) suggested that the formation of bonds with non-drug-using individuals is the most important protective influence.

1.7 Factors that influence levels of substance use

It was not considered feasible to present a comprehensive review of all the influences on drug use that have been identified. Consequently, this final part of the chapter concentrates on those which relate most closely to the content of this thesis: peer substance use, early initiation, availability, negative effects, expectancies and reasons for substance use.

1.7.1 Peer substance use

Peer substance use has consistently been described as one of the strongest predictors of drug use among young people (Kandel et al., 1978; Huba et al., 1979; Battistich & Zucker, 1980; Jessor et al., 1980; Elliott et al., 1985; Barnes & Welte, 1986; Kandel et al., 1986; Kandel & Andrews, 1987; Lopez et al., 1989; Swadi, 1988, 1999; Brook et al, 1990). There is some evidence that the relationship between peer and individual behaviour may be moderated by age and by gender, although results from studies have been inconsistent (Eagly, 1983; Urberg, 1992). Some have suggested that the importance of the peer group peaks in early adolescence (Berndt, 1979; Urberg et al., 1990) and then diminishes (Brown, et al., 1986; Shrum & Cheek, 1987; Bailey & Hubbard, 1991). Others have noted that the relative importance of peers and parents is

moderated by age with peers gradually becoming more important as the influence of parents diminishes (Andrews et al., 1993).

Most studies that have reported an association between individual and peer substance use have relied on data in which young people who use drugs have reported that their friends are also drug users. This correlation has a history of being interpreted as evidence that peers 'pressurise' each other into substance use (Swadi & Zeitlin, 1988; Glassner & Loughlin, 1987). However, evidence for this argument is limited. Many commentators who have adopted this viewpoint seem to have overstretched statistical associations by ignoring the fact that a causal direction has not been established (Sheppard et al., 1985). More recently, this association has been described as 'peer influence', which is explained as resulting from situations in which drugs are available through friends and friends model use and support pro-drug attitudes and norms (Oetting & Beauvais, 1986). However, critics such as Bauman & Ennett (1994) have suggested that the role of peer influence has generally been overestimated and the high correlations between behavioural variables can be partially explained by two other mechanisms: 'peer projection' and 'peer selection'.

Most studies have measured peer substance use by asking respondents to report on the behaviour of their peers rather than asking the peers to self-report. Peer projection describes the tendency for adolescents to project their own behavioural patterns onto their friends (Holmes, 1968). Thus, even if an individual's behaviour does actually differ from that of their friends, projection will result in behavioural concordance being inflated (e.g. Davies & Kandel, 1981; Sherman et al., 1983; Urberg et al., 1990). Studies based on independent data from friends have generally found weaker correlations between self-reported substance use of friends and individual behaviours (e.g. Fisher & Bauman, 1988). Bauman & Ennett (1994) cite this as evidence that peer projection is likely to cause inaccurately inflated estimates of peer influence.

'Peer selection' refers to the process through which individuals choose friends who are like themselves (i.e. drug users may tend to gravitate towards and form friendships with other users). Relationships may also dissolve if substance behaviours become very dissimilar. Thus high correlations will remain between the substance use of individuals within a peer group, but as the result of substance use influencing friendships rather than vice versa (Bauman & Ennett, 1994). Evidence to support this argument was reported by Fisher & Bauman (1988), who found that at least half of the

shared variance in drug use between friends could be explained by a process of 'peer selection' rather than influence. Consequently, if studies neglect to control for peer selection, estimates of peer influence are likely to be inaccurately inflated (Farrell & Danish, 1993). It has also been argued that peers may become more like one another through a process referred to as 'peer socialisation' (Kandel, 1984; Hart & Hunt, 1997).

Overall it seems likely that peer substance use influences individual behaviour to a certain extent, although possibly to a lesser degree than previously suggested. Furthermore, little is known about who within a peer group is likely to have the greatest influence. One possibility is that 'best friends' have more impact than other individuals in a peer group. For example, there is evidence that smoking and drinking behaviours are strongly influenced by best friends (e.g. Jackson, 1997) and possibly more so than by the wider peer group (Braucht, 1980; Windle & Barnes, 1988; Urberg, 1992). The picture relating to drug use may be more complex. In a longitudinal study, Kandel and colleagues found that initiation into cannabis use was more closely linked to the wider peer group than the best friend, whereas the opposite was true for other illicit drugs (Kandel et al., 1978). This could indicate that the influence of a best friend may be more important in the case of illicit drugs other than cannabis. Brown (1989) suggested that the influence exerted by the peer group may differ in strength from that of the best friend because the larger grouping is based on reputation while best friend relationships are more intimate interactions. These latter relationships are likely to involve more contact and could therefore exert a greater influence. On the other hand, Brown (1989) also asserts that an individual's social identity may depend heavily on the peer group or 'crowd' with whom they identify and thus the social crowd could also exert a powerful influence.

1.7.1.1 Peer cluster theory

Peer cluster theory regards adolescents' substance use as directly influenced by their closest friends (Oetting & Beauvais, 1986, 1987). Psychosocial factors are seen as indirect influences that impact on the choice of friends and contribute to the peer group norms concerning substance use. In other words, the influence that these factors have on drug use is mediated by the peer cluster which exerts the strongest and most proximal influence of all (Dinges & Oetting, 1993). However, the influence exerted by the peer cluster is seen as quite different from the concept of 'peer pressure' as Oetting and Beauvais explained: "*...every member of a peer cluster is seen as an active,*

participating agent in shaping the norms and behaviours of that cluster, in deciding whether, when and how to use drugs. From the outside, it may look like peer pressure is leading to conformity, particularly if a parent or counsellor wants to believe in the innocence of a particular child...[but] every youth in a peer cluster is constantly and actively involved in deciding what is "right". There is no pressure applied by others on one particular child" (Oetting & Beauvais, 1987, p.206, quoted in Dinges & Oetting, 1993, p.257). The authors cited data showing a close correspondence in the types of drugs used between individuals and their peers as evidence to support this theory. However, this view of the role of peers in determining substance use seems relatively extreme and could be criticised for failing to account for use engaged in by individuals who do not identify closely with a peer group.

1.7.2. Early initiation

For many young people in the UK, first use of an illegal drug ('initiation') occurs before the age of 16 and there is evidence that the average age of initiation differs between drug types (Balding, 1997, 2000). Cannabis is often the first illicit drug used, with initiation into use of Class A drugs usually taking place a few years later (if at all). Most initial experimentation with a range of different drugs seems to occur between 12 and 17 years, with the ages 14-16 having the highest incidence (Parker et al., 1998, 2001). Similar findings have been reported by studies conducted in other countries. For example, DeWit and colleagues (1997) noted that most drug initiation took place between the ages of 12 and 22 with a peak period between 15 and 19 years in a sample of young Canadians.

An increased risk of heavy drug use and associated psychosocial adjustment problems has been linked with initiating substance use at a younger age (Kandel, 1982; Fleming et al., 1982; Robins & Przybeck, 1985; Labouvie & McGee, 1986; Kandel & Davies, 1992; Breslau et al., 1993; Stenbacka, et al., 1993; Hall et al., 1994; Anthony & Petronis, 1995). . For example, Ferguson and Horwood (1997) reported an association between early cannabis use and heavier subsequent substance use, juvenile offending, mental health problems, unemployment and school drop-out. In another study, Clapper (1992) reported that age of onset of regular use was a strong predictor of current frequency of alcohol, marijuana and cigarette use in a sample of undergraduates. Rachal and colleagues (1982) found that alcohol misusers reported first using at an earlier age than users. Kandel (1982) noted a relationship between early initiation into

use of any drug and greater involvement in other drug use and use of more dangerous drugs (Kandel & Yamaguchi, 1993). Furthermore, some studies have reported that a later age of initiation to drug use predicts less extensive drug involvement and a higher probability that use will cease (Kandel et al., 1976). However, a study by Anthony & Petronis (1995) found no support for the hypothesis that the association between age of onset and subsequent behavioural patterns is simply due to the length of drug-using career being longer in those who started using at an earlier age.

A number of interpretations of this relationship have been proposed. For example, Jessor and colleagues (1980) suggested that the link was not causal, but due to early use being an indicator of a whole range of factors which predisposed young people to problem behaviours. The findings reported by Fergusson et al., (1997) accord with this perspective. In contrast, Kandel and associates have proposed a more causal relationship in which early onset sets off a chain of events that result in a range of negative consequences (Kandel et al., 1986). This suggests that the relationship between these variables is complex and that age of initiation is an important marker of future risk.

1.7.3 Availability

Society restricts the availability of most psychoactive substances through various controls, laws and social norms. However, there is evidence that during the past decade many drugs have become more readily available to adolescents and young people (e.g. Parker et al., 1995, 1998; Balding, 1997, 1998, 2000; Egginton et al., 2001). In fact, recent estimates suggest that common 'street drugs' may have become as much as ten times more available during the last decade (UKADCU, 1999). Nevertheless, availability is likely to differ across the country and is a crucial influence on use. For example, Gottfredson (1988) reported that availability of drugs differed in different schools and that this was more influential on drug use than individual characteristics. Gorsuch and Butler (1976) noted that when alcohol is readily available, prevalence of drinking and frequency and intensity of use all increase. In a study by Maddahian and associates (1988), after available money was controlled for, measures of drug availability were found to relate significantly to tobacco use, alcohol, cannabis and other drug use. Similar results have been reported in other studies (e.g. Barnea et al., 1992; Teichman et al., 1989).

1.7.4. Negative effects

To date, most health education initiatives in the UK have addressed different substance types in isolation. A common approach has been to focus on the potential negative effects (e.g. anxiety, hangover) that users risk experiencing when they consume a drug. The rationale behind this is that if young people are aware of the potential negative consequences of drug use, they will be less likely to use. Despite the emphasis placed by prevention programmes on highlighting such risks, the influence of negative effects on future consumption patterns has received limited attention from research and there is little evidence for its success in deterring future use (Huba et al., 1986). Kovach and Glickman (1986) argue that drug prevention and education programs which are primarily focused on the negative side to drug use or which promote an abstinence ethos are a waste of resources. Instead they suggest that the focus should turn to raising awareness and understanding of the factors and processes which can lead to problems with drug use.

Perceptions of the potential 'negative effects' from substance use are central in the cost-benefit assessment of drug use described by Parker and colleagues (Parker et al., 1998; Measham et al., 1998). They argue that decisions to use a particular drug are based on a complex assessment of the 'pros' and 'cons' relating to its use. Costs include both short-term and long-term risks or side effects, while benefits relate to the enjoyment or pleasure obtained from use. It has also been suggested that this decision-making process is likely to be affected by the age, intellect and maturity of individual users, but that the process is applicable throughout adolescence and young adulthood. However, Parker and colleagues (1998) warn against over-application of the cost-benefit equation to young people's drug decisions and stress that it should be regarded as a conceptual tool to help to clarify behaviour. This framework for understanding drug-related decisions has its roots in Subjective Expected Utility theory (SEU; Edwards, 1954), which has been widely applied to decision making in other areas of psychology (see Conner & Norman, 1995; Frisch & Clemen, 1994; Critchlow, 1987).

1.7.5 Expectancies

Research concerning substance-related 'expectancies' was initiated by a number of placebo studies in which individuals who believed that they had consumed alcohol behaved as though they were intoxicated (Marlatt & Rohsenow, 1980). These findings suggested that an individual's beliefs or expectancies have a stronger impact on

behavioural changes after alcohol ingestion than the actual pharmacological actions of ethanol. Similar evidence has also been reported for the influence of expectancies on the effects from other drugs (e.g. Mitchell et al., 1996).

Research has focused on how the beliefs that people hold regarding the effects of a psychoactive substance on mood, emotions and behaviour interact with consumption patterns. Goldman and associates (1987) explained that expectancy:

"...refers to the anticipation of a systematic relationship between events or objects in some upcoming situation. The relationship is understood to be of an if-then variety: If a certain event or object is registered then a certain event is expected to follow." (Goldman et al., 1987, p.183).

Studies in the literature on expectancies have gathered data from college students (e.g. Stacy et al., 1990; Gustafson, 1991), alcoholics (e.g. Brown, 1985), adolescents, (e.g. Christiansen et al., 1982) and children (e.g. Miller et al., 1990). Findings suggest that although expectancies are likely to become more refined as an individual gains more experience of consumption, they are generally stable over time (Goldman et al., 1991) and are similar to trait-like beliefs (Young et al., 1990).

A considerable body of research has demonstrated that expectancies predict current and future consumption patterns of alcohol (Christiansen & Goldman, 1983; Brown, 1985; Smith et al., 1986; Mooney et al., 1987; Roehling et al., 1987; Stacy et al., 1990; Wood et al., 1992) and also cannabis and cocaine (Schafer & Brown, 1991; Jaffe & Kilbey, 1994; Stacy et al., 1995). Studies have demonstrated that expectancies have much stronger predictive validity for drinking than more traditional models which have used combinations of background and demographic variables (e.g. Christiansen & Goldman, 1983; Brown, 1985). Some researchers have suggested that manipulation of expectancies may result in altered drinking patterns (see Marlatt et al., 1988; National Institute on Alcohol Abuse and Alcoholism, 1990; Goldman et al., 1991). However, more recently Jones and colleagues concluded that, to date, little firm evidence for this has been published (Jones et al., 2001).

A number of criticisms of expectancy research have been published (Leigh, 1989). In particular, Leigh highlighted the problem that expectancy research lacks a theoretical grounding and suggested that the literature on attitudes and behaviour should be accessed. One major problem has been in determining the relationship between

attitudes and expectancies (Leigh, 1989; Stacy et al., 1991). It is unclear whether expectancies are the cognitive component of attitudes (Leigh, 1989) or if they are theoretically distinct (Stacy et al., 1990).

Related to expectancy research is the study of motivations or reasons for substance use (Farber et al., 1980; Johnston & O'Malley, 1986; Klein, 1992; Smith et al., 1993). Expectancies are distinct from motivations or reasons in that expectancy describes the belief that an individual has about the effects that a substance has on the consumer (Leigh, 1989). In contrast, reasons for use suggest that a substance is consumed in order to obtain a particular outcome. A reason for engaging in a behaviour is closely linked to expectations about its outcomes (Peters, 1960). Consequently, reasons for the use of a substance are likely to be closely related to expectancies concerning the drug's effects (Novacek et al., 1991). Evidence in the literature supports a strong relationship between these two constructs, although the importance of considering the two concepts separately has also been emphasised (Wood et al., 1992; Abbey et al., 1993; Williams & Clark, 1998). After all, if an individual expects a substance to have a certain effect, it does not necessarily follow that they will be motivated to use it to gain this outcome (Mulford, 1983). In summary, an expectancy can be described as concerned with subjective experience, while a reason or motivation for use can take social context and purpose of the behaviour into account. The literature on reasons for substance use is examined in the next section.

1.7.6 Reasons for substance use

Studies that have explored the reasons or motivations which young people give for their substance use have their roots in the alcohol literature. In the late 1940s, Riley and colleagues published a paper that linked type of motive for alcohol use and frequency of drinking (Riley et al., 1948). One of the first studies that examined drinking motives in an adolescent sample was conducted by Jessor and associates in 1968.

The reasons literature can be divided into four groups - studies that examine: (i) reasons for initiation or first use (e.g. Kosviner & Hawks, 1977; Jasso & Wolkon, 1978; Buchanan, 1991); (ii) reasons for continued use (e.g. Johnston & O'Malley, 1986; Newcomb et al., 1988); (iii) reasons for reducing or stopping use (e.g. Traub, 1983; Reeves & Draper, 1984); and (iv) reasons for abstinence (e.g. Marin, 1976; Toohey et al., 1982; Fountain et al., 1999). This review focuses on findings from studies which have examined reasons for continued use, drawing on both the alcohol and drugs

literatures, as studies in the other categories are beyond the scope of the research questions addressed in this thesis. Using the terms 'reason' and 'motivation' interchangeably is not uncommon in the literature (e.g. Newcomb et al., 1988; Connors et al., 1990) and this practice is adopted here.

A wide range of different motives for substance use feature in the literature. Examples include using for fun (Buchanan, 1993), to have a good time with friends, to get high (Johnston, & O'Malley, 1986), seeking insights (Butler et al., 1981), relief of boredom and anxiety, to feel happier, to feel less angry (Toohey et al., 1982), to make friends and to increase personal energy (Murray & Perry, 1984), peer pressure (Dohner, 1972; Glassner & Loughlin, 1987; Pavis et al., 1997), to relax (Dohner, 1972) and to increase creativity (Kamali & Steer, 1976). The majority of these have been generated from studies of alcohol users. There are fewer studies that have examined motives for the use of other psychoactive substances (Johnston et al., 1994; Simons et al., 2000).

The importance that understanding motives for drinking alcohol may have in prevention, intervention and treatment of alcohol problems has been repeatedly stressed in the literature throughout the past three decades (e.g. Jung, 1977; Cox & Klinger, 1988). Cronin (1997) described an advantage of studying reasons and motivations for alcohol use by saying: *"The researcher circumvents the hypothesized "mental algebra" which the drinker engages in to arrive at his/her stated reason for drinking. Expectancies, like attitudes, may be one of numerous cognitive and social factors which influenced the decision to drink. Reasons for drinking cognitions are closer than expectancies and attitudes to the actual response along the continuum from initial cue state to behaviour"* (Cronin, 1997, p.1,292). Cronin went on to argue that reasons are likely to result from a range of cognitive and social factors (such as expectancies) and are therefore more proximally related to behaviour, so consequently should be better predictors of alcohol use. The dominant multi-dimensional approach to studying substance use recognises that a whole range of biological, psychological and social factors interact, forming a complex web of influence on the development of substance-related problems. It has been suggested that studying reasons for substance use may help efforts to predict, explain, and understand substance use in all of its forms (Johnston & O'Malley, 1986). There is likely to be considerable variation in the factors underlying these behaviours between individuals and a unitary treatment approach is consequently unlikely to be equally effective with different types of users (Segal 1986a). By recognising the reasons or motivations for substance use, different user

profiles may be identified as more or less likely to respond to a variety of treatment and prevention efforts. Furthermore, if reasons for use that are related to problems with use can be identified, there may be an opportunity to develop ways of screening people to identify those most at risk of developing substance-related problems (see Cronin, 1997). The main findings from the 'reasons' literature can be grouped into five categories. These are summarised below:

i) Variation in reasons for use between different drugs

Substance users often cite differing reasons for taking the same drugs (Segal, 1986) and reasons for use may differ between different drug types and over time (Robbins et al., 1970; Lombillo & Hain, 1972; Segal et al., 1980a; 1982; 1983; Segal, 1986; Johnson & O'Malley, 1986). However, it also seems that there is a certain amount of commonality in reasons or motives across different drug types (Newcomb et al., 1988; Schafer & Brown, 1991; Simons et al., 2000). Evidence for this is presented by Simons et al. (2000). They found that alcohol and cannabis differed on 'expansion' and 'social' motive dimensions but had similar profiles of 'coping' and 'conformity' motives. In another study that provided support for this latter hypothesis, Segal et al., (1982) identified three general types of motive for substance use: 1) expanded awareness-insight; 2) drug effect and 3) increased activity.

ii) Relationship between reasons and consumption patterns

A positive relationship between the number of reasons for alcohol use and consumption patterns has been consistently demonstrated in the general population (Mulford & Miller, 1960; Glynn et al., 1983; Smith et al., 1993), among samples of older adults (e.g. Graham et al., 1996), college students (e.g. Jung, 1977; Beckman & Bardsley, 1981; Ratliff & Burkhart, 1984; Pang et al., 1989; Goodwin, 1990; Cronin, 1997; Williams & Clark, 1998) and young people (Carman et al., 1983; Plant et al., 1990; Foxcroft & Lowe, 1993; Bradizza et al., 1997). Although less widely tested, evidence for a similar relationship exists in the drugs literature (Carman, 1979; Johnson & O'Malley, 1986; Newcomb et al., 1988; Simons, 2000). For example, in their sample of young people, Johnson and O'Malley found that frequency of use of nine different substances was positively related to the number of reasons for use endorsed for each drug (Johnson & O'Malley, 1986).

Secondly, a number of studies have presented evidence that particular categories of reasons (e.g. drinking to cope), as well as individual-specific reasons, are related to patterns of use (e.g. Mulford & Miller, 1960; Cahalan et al., 1969; Jung, 1977; Ratliff & Burkhart, 1984; Pang et al., 1989; Wood et al., 1992; Cooper, 1994; Beck et al., 1995; Simons et al., 2000). For example, Goodwin (1990) reported that drinking to release emotional tension was the strongest predictor of alcohol consumption in a sample of college students. Snow and Wells-Parker (1986) reported that drinking for 'pleasure' was associated with heavier alcohol consumption and that drinking for 'escape' reasons was positively associated with the quantity of alcohol consumed. Studies using samples from younger populations have reported similar results (e.g. Sharp & Lowe, 1989; Plant et al., 1990). Foxcroft and Lowe (1993) found that the heavier drinkers in a sample of 16-19 year olds were more likely than other drinkers to endorse drinking because they liked the effects, to get intoxicated and to cheer themselves up.

Although less extensively documented, there is evidence of similar relationships in the drugs literature (e.g. Bailey et al., 1992). For example, one study of adolescents noted an association between using drugs for 'pleasure' or 'to cope' and frequent drug use, while less frequent users tended to report using 'to belong', 'to become more creative' or for 'aggressive purposes' (Novacek et al., 1991). There is also evidence that motives for substance use change as experience of using increases (Johnson & O'Malley, 1986; Newcomb et al., 1988).

iii) Relationship between reasons for use and problematic use

The association between reasons and problems related to use has been widely discussed in the alcohol literature (Johnson et al., 1985; Connors et al., 1990; Klein, 1992; Simons et al., 2000). For example, using a sample of college students, Bradley and colleagues (1992) used a stepwise regression to show that personal/psychological motives for use and social/convivial motives predicted problem scores independently, when controlling for consumption levels. In particular, a positive association between drinking alcohol to cope with negative mood states (or to increase positive affect) and alcohol problems has been noted (e.g. Farber et al., 1980; Glynn et al., 1983; Thombs & Beck, 1994; Weinberger & Bartholomew, 1996). Wood and colleagues found that college students with high alcohol-problem scores were those who were using alcohol for 'pathological' or self-medicating reasons (Wood et al., 1992). More recently, studies have suggested that the relationship between reasons for use and problems is partially mediated by

intensity of consumption (e.g. Cooper, 1994; Carey & Correia, 1997). These findings suggest that alcohol-related problems are not simply explained by consumption patterns. Nor are motives for alcohol use simply a proxy for high-risk drinking (Jessor et al., 1968; Klein, 1992), as some studies have shown that reasons predict problems when high-risk consumption patterns are controlled for (e.g. Carey & Correia, 1997). Instead, the motivations for drinking seem to influence the likelihood that adverse consequences will be experienced.

In contrast, relatively few studies have reported on the relationship between reasons for drug use and problems, although there is some evidence for similar patterns. For example, Carman (1979) reported a positive association between the number of motivations for drug use endorsed and problematic outcomes associated with substance use. This study also found that problematic use was linked to 'personal effects' motivations (defined as motivations concerned with changing one's self-perception or to cope with dissatisfaction with oneself) for drug use. Overall, the literature suggests that problematic substance users may have reasons motivating their use that differ from those reported by non-problematic users.

iv) Relationship between reasons for use and gender and age

There is evidence that reasons or motivations for alcohol use differ between males and females (e.g. Edwards et al., 1973; Ratliff & Burkhart, 1984; Carman & Holmgren, 1986; Orford & Keddie, 1985; Klein, 1992; Wood et al., 1992; Billingham et al., 1993; Dunne et al., 1993; Beck et al., 1995) although results have been inconsistent (e.g. Carey & Correia, 1997). In one study of 16-19 year olds, heavy drinking females were more likely to endorse drinking alcohol in order to feel more confident (Foxcroft & Lowe, 1993). In contrast, Bagnall (1988) reported that males (in a sample of 13 year olds) tended to report drinking for reasons pertaining to social confidence and enhancement more than females of a similar age. One possible interpretation of this inconsistency is that reasons for alcohol use vary by age. This is discussed later in this section.

Studies have also noted gender differences in the relationship between reasons for alcohol use and adolescent drinking behaviour (Windle & Barnes, 1988). A significant relationship between 'escape' reasons for drinking and quantity of alcohol consumed (Snow & Wells-Parker, 1986) and an increase in the number of times of being 'drunk' was reported in female 12-17 year olds (Windle & Barnes, 1988). In the

same study, males were found to report more social pressure reasons for drinking. Gender differences in the types of reasons cited for drug use have been reported in the literature. For example, in a study conducted by Newcomb and colleagues (1988), males were found to use cannabis to enhance positive affect and creativity in contrast to female respondents who were more likely to use this drug to reduce negative affect. In another study of 2,637 adolescents, Novacek and colleagues found that females reported more coping reasons for drug use while male respondents endorsed more pleasure reasons (Novacek et al., 1991).

A possible reason for the lack of consistency in the literature on gender and reasons is that the samples used have differed in age and this may have had an effect on the results obtained. Evidence that reasons for use may differ by age can be found in a number of studies in both the alcohol and drugs literatures. For example, Newcomb et al. (1988) reported that older teenagers were more likely to report using drugs to reduce negative affect than younger teenagers. Similarly Novacek and associates (1991) found that high school students endorsed more coping and pleasure reasons for drug use while middle school students in their sample tended to report more belonging and creativity reasons for use. A possible explanation for these differences was offered by Haden & Edmundson who suggested that as young people mature, their motivations for substance use become more personally focused (Haden & Edmundson, 1991).

Despite a few exceptions, overall the findings in the literature on drug and alcohol 'reasons' have been relatively consistent. However, the number and quality of studies that have focused solely on reasons for the use of different illicit drugs is limited. The next section discusses some of the limitations identified in the literature in more detail.

1.7.6.1 Limitations

Perhaps most importantly, research on reasons for substance use has relied on the ability of users to provide accurate self-reported reasons for drug use. This does not allow for the possibility that some users may not clearly understand or be able to express their reasons or motivations for use of a particular drug. The linguistic repertoires of respondents could also limit the data which they provide. There are additional concerns regarding the reliability and validity of relying on self-reported measures of this nature, although this method of data collection is generally accepted as valid for other substance-related measures in adolescents and young people (Johnston & O'Malley,

1985; Oetting & Beauvais, 1990; Parker et al., 1998 – see Chapter Two for further discussion).

A second limitation is that many analyses of reasons for drug use have grouped all illicit substances together (e.g. Robbins et al., 1970; Kamali & Steer, 1976; Carman, 1979; Butler et al., 1981; Segal, 1985-86; Novacek et al., 1991; Cato, 1992; Buchanan, 1993) or made a simple distinction between cannabis and an unspecified global category labelled 'hard drugs' (e.g. McKay et al., 1992). Given the evidence cited earlier in this section that reasons for use differ between different drugs, this measurement approach is likely to lack sensitivity, particularly when modelling patterns of use.

A third limitation is that some studies have grouped reasons reported by users with hypothetical reasons reported by non-users (e.g. Weinstein, 1976; Reeves & Draper, 1984; Novacek, et al., 1991; Buchanan, 1993). For example, Novacek and colleagues asked people in their sample to respond to questions with the following wording "If I were to use street drugs *it would be* because I was depressed" (emphasis added), which in effect asked non-users to respond hypothetically. If used in a general population sample (in which non-users are more common than users), this type of approach is likely to bias the data towards non-users' perceptions of why other people engage in drug use rather than actual reasons for use.

Several of the studies reviewed have reported data from relatively small samples. For example Simons and associates (2000) presented data on 46 respondents. Although still useful, the results from small studies such as this should be interpreted with care, particularly when compared with studies reporting on data from several thousand respondents (e.g. Johnston & O'Malley, 1986; Novacek et al., 1992).

Lastly, there is a lack of clarity about what is explicitly denoted as a 'reason' for substance use. Some measurement items are very specific (e.g. "drinking to forget troubling things" or "to feel less shy" – Smith et al., 1993), but others are more general (e.g. drinking because "you enjoy it" – Smith et al., 1993; "to celebrate" – Foxcroft and Lowe, 1993; or because "people know I drink" – Pang et al., 1989). Currently influential philosophical models regard reasons as primary explanations of actions (e.g. Davison, 1980). The Collins English Dictionary (2000) defines a 'reason' as "a cause or motive". While some of the statements in the literature described above lie within this definition, it seems less appropriate for others. For example Cronin (1997) used items such as "drinking makes me feel outgoing and friendly", "drinking makes me feel

calm" and "I get better ideas when I'm drinking" in his study of college students. All of these could arguably have been included in a scale to measure expectancies.

1.8 Functions for substance use

An alternative to the terms discussed above, which has been used much less extensively in the literature, is 'function'. The Collins English Dictionary (2000) defines a 'function' as "the natural action or *intended purpose* of a person or thing in a specific role" (emphases added). For example, one function of coffee consumption could be 'to keep the user awake'. Although the term 'function' appears to have been largely ignored in the literature on drugs and alcohol over the past two decades, it is adopted in preference to 'reasons' or 'motivations' in the current thesis. The main reason for this decision is that while in some cases the reason and function could be identical, the latter term is more exact and thus less likely to result in confusion. For example, a reason for drinking coffee could be 'in order to stay awake' (the same as the function). However additional reasons might include 'because I was offered a cup' or 'because there was no tea', neither of which provide as much detail on the underlying purpose of the behaviour. These are attributional issues relating to the allocation of responsibility for events, originally described as the method of attributing causality by the 'naïve scientist' (Heider, 1958). Thus Weiner's (1974) intuitively plausible distinction between internal and external attributions is challenged by the deployment of words and patterns of usage: 'I'm cold today' should be an internal attribution and 'it's cold today' an external one, in spite of the fact that the two statements are functionally equivalent (Hilton & Slugoski, 1986). One author writing on the merits of using a 'functionalist approach' to understanding substance use explained that: "*Functions serve to define the meaning of the behaviour to the individual in terms of his own valued goals and his expectations of attaining these goals by means of the given behaviour.*" (Sadava, 1975, p.24). In this paper he suggests that individual, personal or psychological functions can help to explain individual differences in consumption within the same or very similar social and environmental contexts. A number of parallels with the literature on reasons and motivations are evident. For example, both positive and negative personal functions for substance use have been linked to patterns of consumption (e.g. Sadava, 1971; Davis, 1972; Jessor & Jessor, 1973) and heavier use is linked to more functions for use (Sadava, 1973). Furthermore it has been argued that functions mediate the

relationship between personality factors and drug consumption behaviours (Jessor et al., 1968; Sadava, 1974).

It is important to note the distinction between 'functional drug use' and 'instrumental drug use'. Ball (1965) described two types of drug taking: 'instrumental' and 'appreciative'. These categories were also used by Glaser (1974). He explained that *"instrumental drug use is intended for a specific physiological effect"* and that this effect is created *"by purely chemical reactions"* (p.39-40). Instrumental use has also been defined as use to *"achieve desired goals"* (p.7, WHO, 1997). Examples cited include drivers, nightworkers or students using amphetamines to improve concentration and relieve tiredness, an insomniac using barbiturates to help sleep and a person who is dependent on heroin using opiates to relieve withdrawal symptoms. In contrast, 'appreciative drug use' *"...is done to conform to socio-cultural expectations in particular situations where shared norms and values encourage it"* (p.40, Glaser, 1974) and usually takes place in a group context. The examples of appreciative use cited by Glaser include a guest at a party drinking champagne primarily because they think this behaviour is expected of them. A limitation of this framework for understanding substance use is that 'instrumental use' appears to be confined to exploiting the specific physical effects of a drug. It does not encompass use for more subtle social or psychological purposes. In contrast, the recognition of perceived 'functions' for substance use, as suggested above, allows all three of these motivations for use to be recognised.

1.9 Summary of literature review

This chapter has presented an overview of the relevant background to and literature on contemporary substance-use research in young people in the UK. The chapter opened with an introduction to the plan of the thesis, followed by an overview of the current UK drug policy context and the related funding and service provision. The third section defined the terms used in this thesis and introduced the main drug types that are examined in the research programme. Next, the research base was reviewed. An overview of prevalence data was provided followed by discussion of factors that have been linked to substance use. The final sections of Chapter One were devoted to considering several specific factors that relate to substance use in more detail. Particular emphasis was given to the role of peers, expectancies and reasons for use. A

discussion of some limitations in the reasons literature led to the conclusion that the alternative concept of 'functions' for substance use was more exact and therefore preferable to 'reasons' or 'motivations'.

1.10 Aims and structure of the thesis

The overall aim of the thesis is to identify and model key influences on patterns of consumption, problems and future use expectations relating to drugs commonly used by young people.

This first chapter places the research undertaken into context by reviewing material from the existing alcohol and drugs literatures and identifying knowledge gaps. The second chapter discusses a range of methodological issues that were considered during the design and execution of the research programme, again drawing on the available literature. Chapters Three and Four report on two initial studies that subsequently informed the design, execution and analytical approach adopted in the main study (Chapter Five) in order to address the key research questions. Study One, (described in Chapter Three) used in-depth qualitative interviews to identify key influences on the substance consumption patterns and related decisions of 40 young people. The findings from this first study were then used to inform the development and focus the selection of measures in the two subsequent quantitative studies. The second study examined the feasibility of developing two scales based on the results from Study One and using these to model patterns of consumption and future use expectations regarding alcohol, cannabis, amphetamines, ecstasy and LSD. Chapter Five describes the main study in which peer interviewers conducted face-to-face, quantitative interviews with young polydrug users. The results from the two earlier studies informed the selection of a raft of measures that were then used to model current patterns of substance use, problems related to use and future expectations for five drug types in Study Three. Finally, Chapter Six presents an overall discussion of the research findings and limitations in the context of current research, policy and practice and suggests future directions for research in this area.

CHAPTER 2: METHODOLOGY OVERVIEW

2.1 Introduction

Chapter One introduced the reader to the background to the research questions chosen for this thesis and the context within which the research studies are set. This chapter provides an overview of the methods selected for the research studies and the rationale behind these choices. It introduces the reader to the considerations addressed during the planning stages of these studies. Methodological issues that relate to all three studies are discussed, drawing on examples from the literature. Where the three studies differ in design and procedure, discussion is limited to the subsequent chapter devoted to the particular study (Chapters Three, Four and Five). The finer details concerning the selection of specific measures and analytical approaches are also presented in the separate chapters. This chapter has the following three objectives:

1. *To describe general sampling considerations.*

2. *To describe design considerations and the specific study designs used.*

3. *To reflect on the strengths and limitations of different methodological approaches to implementing the research designs, given the practical context.*

These objectives are addressed in six sections. In the first section, the study population is described and decisions concerning the parameters of the sample are summarised. Second, general approaches that can be used to study drug use among young people are considered and the sampling methodology is described. Third, the research designs and key questions are presented, followed by a discussion of the merits of using a combination of qualitative and quantitative methodologies. The fourth section considers issues pertaining to measurement (domains, recall periods, psychometric issues) and discusses the range of options for measuring substance use that exists in the literature. This is followed by an overview of data collection and administration issues, including strategies to enhance the accuracy of self-report. The chapter closes with a summary of the sampling, design and methods used in the three studies.

2.2 Study population

The chosen study population was young illicit drug users who were not in contact with drug or alcohol treatment services. Although some researchers have described this type of population as 'recreational drug users' (e.g. McMillen, 1997; Power et al., 1996; Parker & Measham, 1994), this term is not used in the current thesis as it makes judgements about the dominant patterns of substance use within the population. As discussed in Chapter One, it is unclear to what extent young drug users within the non-treatment population may experience dependence or problems associated with their consumption patterns and so to describe their use as 'recreational' was judged to be inappropriate.

Strategic policy on drug prevention and use in the UK refers to 'young people' as those under 25 years (UKADCU, 1998). As funding for this research was provided within this context, the same terminology was adopted for the studies described in this thesis. Study resources meant that in order to achieve sufficient numbers of participants for analyses by age, a restricted age range would be required. The age range that was above the years of compulsory schooling (i.e. 16–24 years) was divided into four groups thought to be similar within themselves (16-17 years; 18-19; 20-22 and 23-24). It was decided that the research would focus on the three lower bands (those aged 16-22), to ensure that both those in late adolescence and young adulthood were adequately sampled.

2.2.1 Inclusion/exclusion criteria

The aim of the research programme was to model patterns of use, problems and future expectations regarding substance use in a sample of young people. Tobacco was excluded on the grounds that this is fundamentally very different from other drugs used by young people, as nicotine does not have a markedly intoxicating effect. It was critical that sufficient data on the consumption of the target substances and associated behaviours were gathered for the study aims to be addressed. Resource constraints dictated that a sample with experience of substance use which exceeded population norms was required in order to examine the key research questions in relation to drugs other than alcohol and cannabis. A number of inclusion criteria were devised to ensure that the samples recruited were appropriate. These differed slightly between the studies and are therefore described in the individual methods sections in subsequent chapters.

A common exclusion criterion across all three studies was that respondents had had no contact with a drug or alcohol treatment service. This criterion was designed to ensure that the sample did not consist of people with extreme substance use problems that had already been recognised by the treatment system.

2.3 Sampling issues and strategies

As outlined in section 2.2 above, each of the three studies required a sample aged between 16 and 22 years, whose substance use exceeded population norms and who had not had contact with drug or alcohol treatment services. This section explores some of the general issues considered when deciding on the sampling strategies for the three studies.

2.3.1 Sampling methods

Much of the research that has examined patterns of substance use among adolescents and young people, both in the UK and elsewhere, has sampled through educational establishments (e.g. Parker et al., 1995; Balding, 1997, 2000; Miller & Plant, 1996; Johnston & O'Malley, 1997, 2000; Wright & Pearl, 1986; Boys et al., 2001a). This type of approach is economical as it provides a convenient sampling frame from which to draw a probability sample. A limitation is that it excludes young people who are not participating or regularly attending mainstream education (e.g. persistent truants or school excludees). Nevertheless, this is a convenient means of obtaining representative samples from the population who are of compulsory school age. However, once compulsory schooling is completed (at 16 years), the sample that can be obtained through educational establishments becomes more limited. A substantial number of studies have sampled participants over 16 years through colleges or universities (e.g. Sadava, 1973; Webb et al., 1998; Bennett et al., 1999; Clapp et al., 2000). While enabling large numbers of young people to be accessed and interviewed rapidly, this approach excludes young people in the employment market or those who are unemployed and is therefore biased. To try to redress this problem, UK studies such as the British Crime Survey (Ramsay & Percy, 1996; Ramsay & Spiller, 1997; Ramsay & Partridge, 1999) and the HEA/BRMB 'Drug Realities' survey (HEA/BRMB, 1997), have used random probability samples of households to gather data on the prevalence of drug use among people over 15 years old. Once again, this approach also has

limitations: it excludes young people who are living in institutions (such as university or college halls of residence) and is also extremely resource intensive to conduct.

Gaining a representative sample of the study population is of particular importance in research that seeks to calculate prevalence estimates of a particular behaviour. The probability sample is less critical in studies concerned with modelling behaviour within certain population segments or subgroups (such as cannabis users, for example). Indeed, members of a subgroup are often hidden, so the estimation of the size and characteristics of the total population under study is problematic. Gaining access to such populations where no formal sampling frame exists (often referred to as 'hidden populations') is a recurring challenge within social research. A variety of research methods have been employed to combat this problem. An approach often used in traditional ethnographies involves the use of 'key informants' to facilitate the researcher's access into a social network that is part of a hidden population (e.g. Becker, 1963; Fielding, 1981; Adler, 1985; Fountain, 1992; Moore, 1993). This practice incurs a number of problems which are discussed by Griffiths and colleagues (1993). In particular, it is very time consuming (and therefore resource intensive) and can only yield data from a limited group of individuals. The sample is also likely to be strongly affected by the nature of the key informants and how they were accessed. While useful for gathering richly detailed qualitative datasets, this approach is unsuitable for studies that require the compilation of large quantitative datasets or data from a wide range of types of individual, or where the study aims to represent the whole population.

An alternative recruitment strategy is to use network samples, (also referred to as 'snowball sampling' (Biernacki, & Waldorf, 1981; Hartnoll et al., 1997; Korf, 1997). This method is dependent on the assumption that research questions can be addressed satisfactorily using samples that have not been randomly generated (Honigmann, 1982). Each individual that is accessed during the sampling stage is asked to nominate another suitable candidate for the study. The process is repeated until no new nominations are received or until sufficient recruits have been obtained. Snowball sampling has had a history of success in accessing hidden populations of drug users (e.g. Biernacki, 1986; Erickson et al., 1987; Avico et al., 1988; Diaz et al., 1992; Forsyth, 1996; Lenton et al., 1997). To help to ensure adequate coverage of the target population, some studies have deliberately structured their snowball samples to ensure that a range of demographic groups is covered (e.g. Griffiths, 1998). As the sample increases in size, their key demographic characteristics are recorded in a matrix (e.g. gender by age group

membership). If the number of cases occupying a particular cell becomes too large and the matrix becomes unbalanced, individuals with particular characteristics may be targeted as the sampling process progresses further, until this imbalance is redressed. The main shortfall of the snowballing approach is that the resulting sample is not randomly generated and so the degree to which findings can be generalised to the total population is uncertain. Nevertheless, it has distinct advantages in allowing theories and models to be tested quantitatively on sizeable numbers while remaining relatively economical.

As previously explained (see section 2.2), the three studies required samples of 16-22 year olds with relatively frequent patterns of substance use to address the research questions. Given current population prevalence estimates for the target behaviours (see Ramsay & Partridge 1999), had a random sampling procedure been used, the numbers required to be certain of accessing sufficient 'current substance users' for meaningful analyses by drug type would have been considerable. This approach was therefore discarded in favour of a purposive structured snowball recruitment strategy. This decision was primarily based on resource constraints. The next sub-section in this chapter describes how the research designs were selected.

2.4 Research designs

In social research, study design has two purposes: "*To provide answers to research questions*" and "*to control variance*" (Kerlinger, 1973, p.300). Decisions regarding the present research programme therefore aimed to incorporate principles of good research design to address the key research questions, while remaining practically feasible within available resources. The design of a study is commonly a compromise between the ideal and the practical. This section discusses some of the design issues that were considered when planning the three studies.

The research questions to be addressed did not require an experimental or quasi-experimental design. A sample survey design was therefore appropriate. A sample survey collects data from a number of individuals within the population (the sample) in order to examine the incidence, distribution, and inter-relation of naturally occurring events and conditions. The aim is to then generalise these findings to the total population. A 'sampling frame' in a survey (the list of units or individuals from which the sample is drawn) is developed to help this generalisation process. However, as

previously explained (see section 2.3.1), when there is no formal sampling frame available for this process (such as when surveying drug users) alternative methods are required. There are essentially three types of survey:

(i) the prospective cohort survey, (where subjects are re-interviewed at several time points - e.g. Botvin et al., 1990, 1992, 1995; Parker et al., 1995, 1998; Boys et al., 2001a);

(ii) the unlinked repeated survey, (where data are collected at several time points from the same population without linking - e.g. Ramsay & Percy, 1996, Ramsay & Spiller 1997, Ramsay & Partridge 1999; Balding, 1999, 2000; Johnston & O'Malley, 1999, 2000); and

(iii) the cross-sectional survey, (where data is collected at one point in time only - e.g. HEA/BRMB, 1997; Release, 1997; Boys et al., 1997; Griffiths, 1998).

In the first two types of survey, data are collected from the same population at two or more points, allowing changes in variables pertaining to behaviour or attitudes to be measured over time at the individual level (where data is linked) or the population level. These designs are particularly useful when exploring causal inference. However, collecting data at several time points is very resource intensive. In contrast, the cross-sectional design is useful for providing data to describe a population, but can also be used for imputing causal relationships when resources preclude more expensive follow-up designs (Hennekens, & Buring, 1987). Practical considerations in the current research programme led to the decision to carry out three separate cross-sectional sample surveys. This approach was appropriate for addressing the key research questions under investigation. These are detailed in the following section.

2.4.1 The research questions

The research programme described in this thesis was designed to address four key questions:

1. *What factors do young people cite as influencing their substance use?*

2. *Is it feasible to measure 'functions' for the use of <u>different</u> substances using the <u>same</u> set of measures?*

3. *Can 'functions' for substance use help to explain patterns of consumption, associated problems and future use expectations regarding a range of drugs commonly used by young people in the UK?*

4. *What impact does the experience of negative effects have on substance use?*

Three separate studies were designed and implemented to address these four questions. The first study was exploratory and used qualitative methods to identify salient influences on substance use from the perspective of young people. The purpose was to inform the identification of domains and measures for use in studies two and three. The second study (Study Two) was designed to build on these initial findings by developing measures to assess functions and negative effects and by testing the feasibility of using such measures in models for patterns of substance use and future expectations. The main study (Study Three) aimed to develop and test the models further. This final study explored the relationship between key variables in depth by modelling current patterns of use, problems associated with use and future use expectancies for six target drugs.

2.4.2 Integrating qualitative and quantitative research perspectives

The importance of using a combination of qualitative and quantitative approaches to address research questions has been strongly promoted within the drug research field (McKeganey, 1995; Power, 1995; Rhodes, 2000). The term 'quantitative' describes data that can be expressed in terms of number and is often used as a synonym for any research study design or statistical procedure which generates or uses data of this nature (Schwandt, 1997). In general, the term 'qualitative' is used to distinguish non-numeric data collection procedures from their quantitative counterparts. The range of qualitative

research methods is extensive and includes naturalistic inquiry, ethnography, case study research, life history methodology and narrative inquiry. The two approaches differ in terms of the type of research questions they are suited to answering. Qualitative data can help to facilitate the generation of theory ('induction') while quantitative data allows existing theories to be tested and therefore developed through 'deduction'.

The inductive nature of qualitative methods allows several interpretations of data to be identified that may stimulate the questioning of assumptions made in conventional empirical research. One example of this is highlighted by Moore (1993). He notes how drugs research has tended to use language relating to 'problems' and 'risks' associated with drug use, whereas in his experience, users themselves are more likely to stress the beneficial aspects of consumption. By collecting qualitative data from drug users without forcing responses into a pre-determined agenda, it is possible to generate new theoretical constructs for subsequent quantitative enquiry.

Qualitative research can also play a valuable role in helping to interpret findings generated using quantitative methods. For example, while statistical methods can reveal associations between variables, qualitative research can help to generate theories to explain why such relationships exist and what relevance they may have to the drug user. Rhodes (2000) emphasises the role of qualitative research in challenging misinterpretations of drug use that are liable to being *"...reinforced and reproduced by positivist [1] paradigms"* (p.18) and warns that *"...in the absence of qualitative research, there is a danger of perpetuating understandings of drug use which are devoid of relevance or meaning for participants"* (ibid).

To use a synthesis of qualitative and quantitative approaches was an important consideration in the design stages of the current research programme. The first study was therefore designed to use a qualitative approach to examine influences on polydrug use from the perspective of the individual. It aimed to identify which of the myriad of factors identified in the literature appeared to be most salient to a group of young drug users in London. The analysis of the results from this study was inductive, allowing the construction of theory.

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[1] *Positivism is a philosophical doctrine which suggests that research should be confined to things which can be observed and measured objectively (Stuart-Hamilton, 1995).*

The second and third studies were designed to test this theory and analysis therefore needed to be deductive. A quantitative approach was consequently selected for these two studies.

2.5 Measurement issues

This section describes the issues considered during the development of the research instruments. The range of measures employed varied across the three studies and those specific to individual studies are discussed in the relevant chapters. This section is intended to discuss considerations that were common to all three studies and to describe the common measurement principles used. Particular attention is paid to the challenge of measuring substance use.

2.5.1 Research domains

A research domain is a defined set of measures in a particular area. Recent decades have seen a move in psychology towards using multivariate modelling to try to increase our understanding of human behaviour. Domains have therefore become multi-dimensional, spanning areas that are biological, psychological and social. This practice has coined the term the 'biopsychosocial approach' (e.g. Lawson & Lawson, 1992). The work described in this thesis uses this approach to explain human behaviour. The identification of domains of measurement flows from the questions addressed in a study. Specific measures are linked with domains. For example, a key domain in drug-related research is 'substance use'. Measures of substance use include frequency and quantity. Two domains were common to all three studies: demographics and substance use.

2.5.2 Recall periods

Social research commonly involves the collection of data about past events and behaviours. Participants are asked to recall behaviours engaged in before the data collection point. Careful consideration of recall periods is critical in the development of good quality research instruments. This is of particular importance in the cross-sectional study design where data are gathered at one time point only and changes in behaviours need to be measured retrospectively. The recall periods used are key to ensuring that the full scope of behaviour patterns is captured by the measures used. It is

common for surveys that aim to estimate the prevalence of substance use at the population level to use three recall periods: lifetime, the past year and the past month (e.g. Ramsay & Percy, 1996; Ramsay & Spiller, 1997; Ramsay & Partridge, 1999; Johnston & O'Malley, 1997, 2000; Balding, 2000). This gives the opportunity to estimate the proportion of the population that has ever used a drug, have had recent experience and those who could be classed as 'current' users. Similar recall periods have been widely used in research on drug and alcohol users, although the past week is often used instead of the past month to measure 'current' patterns of drug use (e.g. Plant et al., 1985; Goddard & Higgins, 1999). Some population level studies have widened the recall period to indicate 'current' or 'recent' behaviour to the past three months (or 90 days) (e.g. HEA/BRMB 1997; Brown et al., 1998; Boys et al., 2001a). This helps to capture behaviour patterns that are likely to occur in a particular population intermittently rather than daily, weekly or several times a month (e.g. LSD use) while still remaining appropriate for more frequent behaviours (e.g. daily cigarette use).

The Time-Line Follow Back method (TLFB, Sobell et al., 1979) was developed to help facilitate recall of substance use consumption patterns. Respondents are prompted to recall drinking or drug use during recent weeks by anchoring it to events and occasions. TLFB has been shown to provide reliable measures of alcohol use in the past 30 days (Carey, 1997) and to minimise memory error when recording drug use (Babor et al., 1990). However, some studies (e.g. Hersh et al., 1999) have suggested that the TLFB method is not as valid as using a weekly calendar to aid recall. The use of a weekly calendar method in the current studies seemed inappropriate as it would be unlikely to capture the full extent of intermittent patterns of substance use (as discussed above). It was therefore decided to use two event-based and calendar-based recall periods (past year and past 90 days) drawing on principles used in the TLFB method to facilitate responses. The recall period to indicate 'current' patterns of use was therefore the three months (or 90 days) prior to interview.

2.5.3 Psychometric issues

The principle requirements of the measures used in research are that they should be an accurate (valid) and consistent (reliable) measure of the intended construct. There is no single method for estimating validity and reliability and the various forms that are used vary in terms of the intra- and inter-instrument inferences that are made. The following

two paragraphs briefly summarise common approaches to estimating reliability and validity.

2.5.3.1 Reliability

Reliability examines the proportion of variation in any measurement that is due to actual variation of the attribute under study as opposed to variance relating to error from using the instrument (Beutler et al., 1994). This can be assessed in three ways: by examining (a) internal consistency; (b) inter-rater agreement; and (c) test-retest. Internal consistency tests the consistency of individual items when measuring uni-dimensional constructs. Inter-rater agreement is of particular importance when measuring psychological traits and test-retest examines the stability of a measurement over time.

2.5.3.2 Validity

Five commonly used ways of assessing the validity of a measure are by examining (a) face validity; (b) content validity; (c) construct validity; (d) predictive validity and (e) concurrent validity. Anastasi (1988) explained the distinction between (a) and (b) as follows:

> *"Content validity should not be confused with face validity. The latter is not validity in the technical sense; it refers, not to what the test actually measures, but to what it appears superficially to measure. Face validity pertains to whether the test "looks valid" to the examinees who take it, the administrative personnel who decide on its use, and other technically untrained observers."* (p.144, Anastasi, 1988).

Content validity checks that all the salient features of the intended construct are covered; construct validity ensures that the instrument does not include phenomena germane to other constructs. For example, this could be assessed by examining the extent to which self-reports of drug use concur with other measures of drug use in ways that can be predicted theoretically. Predictive validity examines the extent to which scores on a scale can predict future behaviour. For example, a high correlation between a measure of intelligence and exam performance would provide evidence for the intelligence measure's predictive validity. Finally, concurrent validity checks that there is a strong positive correlation between scores on the instrument and other measures of the same construct. For example, studies have shown that the 30-item version of the

General Health Questionnaire correlates well with the Beck Depression Index (Cavanaugh, 1983), suggesting that it is therefore a valid measure of depression.

2.5.4 Selecting measures

A core set of measures was used throughout the research programme. These are summarised below:

- Gender
- Age
- Ethnic group
- Current occupation
- Amount of disposable income
- Lifetime substance use
- Past year substance use
- Recent substance use (past 90 days)

Socio-economic status:

A notable omission in the above list of measures is 'socio-economic status' (SES). This section discusses the rationale for excluding this measure from the questionnaires used in the research programme.

Selecting a valid indicator of deprivation or socio-economic status was problematic since the target age group did not fit easily into models of deprivation used in previous studies. There are generally four measures used to assess SES: these are summarised below:

1. Occupation. The UK Registrar General's Social Class (OPCS, 1980) classifies occupations according to level of skill and status in the community. This measure was unsuitable for this study sample as many were likely to be studying, temporarily unemployed or working in unskilled occupations while awaiting exam results or to subsidise their education. The variance on this measure was therefore likely to be limited and an inaccurate indicator of SES.

2. Educational attainment. This indicator was also judged to be inappropriate as the samples included a significant proportion of people under 18, who would have had little opportunity to obtain much more than foundation-level GCSE or GNVQ

qualifications. The level of educational attainment was therefore likely to reflect age rather than SES.

3. Income. Once again, because of the age range of the sample, using income as an indicator of SES was also unsuitable as many were likely to be unemployed, studying or in occupations unrelated to their level of ability or education.

4. Neighbourhood/possessions. The British Crime Survey (Ramsay & Percy 1996; Ramsay & Spiller 1997; Ramsay & Partridge, 1999) and the Health Education Authority Drug Use in England survey (HEA/BRMB, 1997) used ACORN ("A classification of Residential Neighbourhoods") categories to classify SES according to postcode. The validity of this indicator is once again questionable for young people. Many students and other people in this age group often live in poor areas, yet are not necessarily 'deprived' and so using postcode as a means of categorisation was also rejected.

Other indicators used in previous studies include whether individuals own or rent their housing, whether they have a car or access to a telephone. Again, these measures were judged to be inappropriate for the current sample: many were likely to be living with their parents or in student hostels or flats, ownership of property was unlikely (due to the age group) and so such measures were likely to yield little variance among a large proportion of the sample. Similarly, the target age group included those under the legal driving age, so asking about car possession was also unsuitable. Finally, access to a telephone seemed equally unlikely to produce much differentiation between respondents.

Although some research has suggested that people from lower socio-economic groups are more likely to be regular or dependent drug users (e.g. Meltzer, et al., 1995), other studies have found very little evidence for such differences (e.g. Ramsay & Spiller, 1997; HEA/BRMB, 1997; Ramsay & Partridge,1999). Consequently, as SES did not appear to be crucial to the central research questions in this thesis, after careful consideration, the decision was made to exclude this measure.

2.5.4.1 Measuring substance use

The range of measurement approaches that are described in the literature for recording patterns of drug use is extensive (Wells et al., 1988). There is a lack of consensus on the best method for measuring drug consumption both within the field of clinical research and research in the general population. To complicate matters, as mentioned in Chapter One, polydrug use is common. This presents additional challenges as there is no immediately logical method of combining use of different drugs into a single summary measure. A review of the literature suggested that drug use measures can be broken down into those that try to measure the extent of drug involvement across an individual's total lifetime, and those which assess recent drug use. A brief summary of some of the more popular methods of measuring substance use is presented in the following paragraphs.

<u>Lifetime substance use</u>

At the very simplest level, many studies have measured whether or not use of a particular substance has 'ever' taken place (e.g. Plant et al., 1985; Ramsay & Percy, 1996; Ramsay & Spiller, 1997; Release, 1998; Ramsay & Partridge, 1999). This measure is a useful filter for targeting more detailed questions about use of a particular substance at appropriate respondents. Other measures that address the extent of lifetime substance use include 'age of first use', which allows the calculation of length of drug-using career (e.g. Sadava, 1974; Sadava & Forsyth, 1977; HEA/BRMB 1997); total number of occasions of use (Johnston & O'Malley, 1997, 2000) and total number of different drugs ever used (e.g. Sadava, 1974; Sadava & Forsyth, 1977). Some studies have grouped users into low, medium and high involvement categories based on the total number of occasions of use. However, this is problematic, as definitions for what constitutes 'low' or 'high' involvement have tended to be somewhat arbitrary (Sadava, 1973) and differ widely across the literature.

Users have also been classified according to empirically-defined categories or stages of use (Sadava, 1972). For example, Egginton and colleagues (2001) described a four-group system for categorising their sample of adolescents: i) 'non-triers'; ii) 'triers/experimenters'- individuals who reported use of a drug more than a year ago or that they did not intend to use again; iii) 'potential users' - those who had used a drug in the past year and intended to do so again and iv) 'regular users' - individuals who had

used a drug at least ten times in the past year, including during the past month, and who indicated that they intended to continue using.

Recent substance use

Again, at the very simplest level, studies have measured whether or not use of a substance has occurred during a particular time period using a binary format (e.g. Parker et al., 1995; Ramsay & Percy, 1996; Ramsay & Spiller, 1997; HEA/BRMB, 1997; Ramsay & Partridge, 1999; Balding, 2000). Other studies have used a number of different indicators to measure recent patterns of substance use, including frequency of use and typical amount used.

Frequency of use

The most common approach to drug-use measurement is to record the frequency of use during specified time periods (e.g. during the past three months) for each of a list of psychoactive substances (e.g. HEA/BRMB, 1997; Johnson & O'Malley, 1999, 2000). Many studies have recorded frequency of use using categories pertaining to the total number of occasions of use (e.g. 1-2 times, 2-5 times, 6-9 times, 10-19 times, 20-39 times or 40 plus times – Johnston and O'Malley, 1999, 2000), time-anchored frequency categories (e.g. never, a few times a year, a few times a month, a few times a week, every day – Botvin et al., 1984, 1990), or non-specific Likert type indications of frequency (e.g. 'regularly', 'occasionally', 'rarely', 'varies', 'once or twice' – HEA/BRMB, 1997). In contrast, other studies have used continuous measures, such as the total number of days of use in the past three months (e.g. Marsden et al., 1998, Boys et al., 2001). This latter approach has the advantage of greater sensitivity to variation and was therefore selected for use in the current research studies.

Typical amount

Measuring the typical amount consumed is particularly problematic for illicit drugs as both purity and actual content are subject to variation. However, the limitations of such measures are usually acknowledged and taken as a proxy for true quantities (e.g. Marsden et al., 1998). Common measures include the amount used on the last occasion of use (e.g. OTI - Darke et al., 1991, 1992), amount used on a 'typical using day' (e.g. Gossop et al., 1997; 1998; Marsden et al., 1998) and the peak intensity of use in a particular time period (e.g. Sobell & Sobell, 1992; Boys et al., 2001). Measuring the

quantity of alcohol or pharmaceutical drug use is less contentious as purity and strength of doses is more controlled.

Biological indicators

Some studies have used biological testing procedures on body fluids or tissues to measure drug use. The most common method is the analysis of urine samples for the presence of illicit drug metabolites (Wolff et al., 1999). Enzyme or radio immunoassay methods are used in preliminary screening to detect drug class. The specific substance is then confirmed via gas chromatography in conjunction with mass spectrometry techniques (Kapur, 1993). Drug metabolites are also deposited in hair. This area of measurement has received increased attention during the last decade (Strang et al., 1993; McPhillips et al., 1998). A disadvantage of testing urine is that samples are unlikely to yield positive results for most drugs unless use has occurred within the last few days (with the exception of cannabis, which is fat soluble). In contrast, the presence of drug metabolites in hair samples is highly stable, permitting the analysis of the aggregate patterns of drug use over several months. Hair analysis appears to be capable of yielding complementary information to urine testing rather than replacing such testing, although the technology is still being developed (Strang, et al., 1993).

While the collection of biological samples for testing is realistic in a clinical context, using such indicators in general population studies is less convenient and is fraught with ethical and logistic problems. The use of biological testing is also expensive and with current technology the data gleaned is essentially limited to whether or not use has occurred during a certain time period. This method therefore seemed inappropriate for use in the current research programme. Furthermore, in the current studies, data on more complex measures, such as number of times used, frequency of use, amount used or age of first use, were required and could only be gathered via self-report. Although biological testing has been commonly employed to confirm the accuracy of self-report measures from populations drawn from the treatment or criminal justice systems (rather than as a primary data source) (Chick & Ritson, 1985), data from samples outside of these systems tend to rely entirely on self-report. The next section examines the evidence for the validity of using this method to measure drug use.

2.5.5 Accuracy of self report

The measurement of sensitive behaviours such as substance use is problematic and has stimulated considerable debate in the research field. As noted in the last section, the most economical and versatile measurement method is self-report. There is a varied literature in existence to support the validity of this approach, with some questioning its accuracy (see Duffy & Waterton, 1984; Mieczkowski 1991; Mott & Mirlees-Black, 1995). Overall, the literature suggests that inaccuracies in self-report are likely to be due to both methodological and/or contextual variables (Magura et al., 1987, Maisto et al., 1990). A number of ways of assessing the reliability and validity of self-reported drug use have been discussed in the literature. Some examples are briefly summarised below:

2.5.5.1 Reliability of self-report

The reliability of self-report data has been examined in numerous studies using a range of respondents, measures and settings (Stephens, 1972; O'Farrell & Maisto, 1987; Babor et al., 1987). Overall, self-report investigations have demonstrated good reliability for frequency of drinking, periods of abstinence, ratings of problem severity, treatment history and legal problems (O'Farrell & Maisto, 1987). For drug use, Maisto et al. (1990) reviewed 14 studies between 1967 and 1988 that had examined drug users' self-reports and concluded that the reliability of such measures of drug consumption is generally good, but varies quite widely between studies. Other studies have provided support for the reliability of self-reported drug use by young non-treatment samples in particular (e.g. Barnea et al., 1987; Hays & Huba, 1988).

2.5.5.2 Validity of self-report

There are three main approaches to assessing the concurrent validity of self-reported drug use that are described in the literature: comparing data with (i) biological indicators (e.g. hair analysis or urinalysis) (e.g. Aarons et al., 2001), (ii) collateral reports (e.g. Darke et al., 1992) or (iii) official records. For example, high levels of agreement have been found comparing biological indicators (such as hair or urine analysis) with self-reported drug use and, overall, results have been encouraging (e.g. Amsel et al., 1976; Magura et al., 1987, 1992). Similarly, some studies have reported a moderate to good agreement between self-reports of periods of hospital treatment and legal involvement (arrests and convictions) and official records. Inconsistency has been

found to be due to individuals over-reporting in relation to official data and errors in official records themselves (Bale et al, 1981). However, it should be noted that most studies that have examined the validity of self-report using these methods, have used criminal justice or treatment populations and so the extent to which their findings are transferable to the general population is uncertain (Harrison, 1997). Nevertheless, the findings from studies that have compared self-reports of drug use in community settings with those in samples of arrestees (such as McElrath, 1994) are encouraging, suggesting that self-report from community samples is generally more accurate. Further support is provided by Oetting and Beauvais (1990), who reviewed the evidence for and against the validity of self-report in adolescents. Overall, they concluded that self-reports of drug use in this age group are generally truthful and reliable. Similarly, Johnston and O'Malley (1985) argued that as long as participants are assured that their responses will remain confidential, there is extensive evidence to support the validity of this measurement approach. A similar conclusion was reached by Parker et al. (1998), who stated that: *"In our view, a well-conducted self-report survey, if it can demonstrate confidentiality and can present itself to young people (over the age of 13) as competent and 'streetwise', is the most cost-effective way of measuring alcohol and drugs prevalence and describing related behaviours"* (p.45).

The detail on substance use required in the studies described in this thesis was considerable and it was therefore necessary to rely on self-report measures. Consequently, it was important to pay particular attention to factors that the literature suggests are likely to enhance or hinder the accuracy of data collected in this way. These issues are discussed in section 2.6.3 of this chapter.

2.6 Data collection and administration issues

This section explores the relative advantages and disadvantages of using different settings for data collection and then examines methods that can be used to enhance the accuracy of the data collected.

2.6.1 Setting for data collection

The setting for data collection can involve one or more of the following: personal face-to-face interview (e.g. British Crime Survey: Mott & Mirrlees-Black, 1995; Ramsay & Spiller, 1997; Ramsay & Partridge, 1999), telephone interviews (e.g. Roffman &

Barnhart, 1987; Kendler et al., 1999; Clapp et al., 2000), self-completion questionnaires under 'exam-type conditions' (e.g. Schaps et al., 1986; Wright & Pearl, 1986; Hansen et al., 1988; Pentz et al., 1989; Botvin et al., 1992; Epstein et al., 1995; Parker et al., 1995; Johnston et al., 1997, 2000) or self-completion postal questionnaires (e.g. Green et al., 1991; Karvonen, 1995; Claussen, 1999; Boys et al., 2001a). Each method has advantages and limitations in terms of the resources required, the measures that are feasible to implement and response rates. There are also concerns about differences in the accuracy of the data obtained on sensitive issues. For example, several studies have demonstrated the marked effect that the mode of interview can have on self-reports of substance use (Johnson et al., 1989; Gfroerer & Hughes, 1991; Aquilino, 1992; Schober et al., 1992; Hoyt & Chaloupka, 1994). Hoyt & Chaloupka (1994) found that telephone interviews yielded lower levels of substance use than face-to-face interviews. In contrast, some studies have associated self-completion methods with higher reported levels of use (Schober et al., 1992).

The use of self-completion questionnaires is very economical as it allows large numbers of individuals to be surveyed at once. However, it has several disadvantages. Simplicity is an essential feature of the self-completion questionnaire as it is vital that all potential respondents are able to understand quickly and easily what information is being requested and how to respond. Otherwise, there is a risk that concentration and interest in participation will be lost and the resulting data will be incomplete or inaccurate. The self-completion format is also vulnerable to missing data if any of the sample have problems relating to literacy. Questionnaires must therefore be designed to be appropriate for the lowest comprehension and literacy levels within a sample. Consequently, the measures that can be used in a self-completion questionnaire are severely limited.

In contrast, a face-to-face interview provides an opportunity to use a relatively complex set of measures, which the interviewer can be trained to implement. This interviewing mode has additional strengths. For example, the respondent can ask for clarification if they do not understand a question and the interviewer can help the respondent to maintain concentration and motivation to complete the questionnaire. In addition, valuable information regarding the actual data collection process can be recorded which would not be available were other research procedures used. In some studies, the interviewer has completed a brief questionnaire at the end of each interview to yield additional data about the event (e.g. Bale et al., 1981). For example, scales to

rate the interviewer's perceptions of the accuracy of the responses given, problems with question comprehension, or if the respondent was intoxicated could be included. This method could provide a means of recording whether any adverse events had occurred during the interview (such as interruption) which might have affected the individual's responses. Such data could be useful at the analysis stage.

The most notable limitation to the face-to-face interview is that it is extremely difficult to ensure uniformity in data collection procedures and hard to control for bias (Brenner, 1985). Each interviewer is an individual and no matter how rigorously they have been trained, there will be differences in how a potential participant perceives them, and in how the actual interview is conducted. This problem is of particular importance in experimental or quasi-experimental studies where differences between a condition (such as levels of a manipulation or intervention), and comparison or control groups, are under scrutiny. For studies such as those described in this thesis, where overall patterns of behaviour in a sample are under study, it is perhaps less critical and the advantages of this method may therefore outweigh the costs.

It is important to recognise that the demand characteristics of the interview situation may also have a marked effect on the data collection process. Studies have found that the participant's perceptions of why the research is being conducted and the interviewer's expectations are likely to impact on the responses given. In particular, the context and circumstances surrounding the encounter and respondents' perceptions of the presentation and behaviour of an interviewer may influence the information that they offer, particularly when the questions concern illicit activities, such as drug use (Ball, 1967; Davies & Baker, 1987; Davies, 1996). For example, McAllister and Davies (1992) found that in a formal clinical situation, reports given by smokers varied according to how severe they thought the clinician/interviewer regarded the extent of their problem. Interviewees may also be suspicious of the perceived motives for the research and particularly concerned about confidentiality, as they may worry that their answers could have repercussions in the legal, social or healthcare arenas (see Davies & Best, (1996) for a detailed exploration of this issue). These latter concerns are perhaps less important for a young non-treatment sample who are not (yet) involved with any of these systems as a result of their drug use and who have no dependants. Nevertheless, it is still important to consider the impact that the interview process is likely to have on responses given and for the interviewer to present themselves as detached and as neutral as possible.

Overall, the assessment of the relative advantages and disadvantages of self-completion versus interviewer-administered data collection procedures is likely to be heavily influenced by the primary research questions to be addressed (and therefore the measures required) and the resources available. In a survey to assess national trends in substance use for example, it would be vital to consider design characteristics that could result in either over-reporting or under-reporting of consumption. In contrast, studies such as those described in the present thesis, where the focus is on multivariate interactions and so a more complex but smaller dataset is required, may find that within resources restraints, the benefits of an interviewer-administered questionnaire outweigh potential disadvantages.

2.6.2 Data collection instruments

Characteristics of the data collection instruments themselves can have a significant impact on the reliability of data collected. A considerable literature exists on the influence of question form, wording and context on responses. Questions dealing with attitudes, opinions, beliefs, values and preferences are particularly vulnerable to these influences. Schuman and Presser (1981) discussed these issues extensively with reference to experimental studies conducted with probability samples drawn from the general population. It is important for these concerns to be considered carefully during the instrument design and piloting stages of a study. In particular, maintaining uniform form, wording and context of questions across all data collection in a study will help to ensure that any influence is consistent across the sample.

2.6.3 Maximising the accuracy of self-report

Section 2.5.5 of this chapter discussed the reliability and validity of self-reported drug use and concluded that, overall, this is an appropriate method for measuring substance use among young people. Nevertheless, it is widely accepted that the validity and reliability of self-reported drug use is likely to vary according to the conditions under which the reports are made (Davies, 1992; Spooner et al., 1992; Hser, 1997). However, with careful attention to the ways in which questions are phrased, the mode of interview and the types of measures used, evidence suggests that the quality of the resulting data can be improved. This section examines strategies that can be used to enhance the accuracy of self-reported data.

There is a considerable body of research documenting how the context of data collection can impact on the disclosure of sensitive information. In particular, interview privacy has been highlighted as vital in the collection of accurate data (Gfroerer, 1985; Turner et al., 1992). Significant associations between the presence of a parent during an interview and low reports of substance use have been found in several studies of adolescents (e.g. Mensch & Kandel, 1988; Schutz & Chilcoat, 1994; Hoyt & Chaloupka, 1994). In contrast, the presence of friends (Hoyt & Chaloupka, 1994) or 'non-parents' (Schutz & Chilcoat, 1994) has been associated with higher reports of substance use. The company of a partner or spouse has been found to have similar effects on the accuracy of responses to sensitive questions (Aquilino, 1993). Aquilino suggested that ideally all interviews collecting data on drug use should be conducted in private, particularly when the respondent is young and still living with their parents. If a number of interviews in a survey fail to meet this criterion, it is likely that this will increase the measurement error irrespective of the mode of interview.

A number of other factors have been identified in the literature as having an impact on the accuracy of self-reported drug use. These include the way in which questions are constructed, data collection procedures, the investigator's perceived intentions and the respondent's cognitive fitness (Babor, et al., 1990; Biemer & Witt, 1997). Table 2.1 summarises the range of factors identified by Babor and colleagues, (1990).

Table 2.1 Factors that influence the accuracy of self-report in research into addictive behaviours (Babor et al., 1990)

<u>Characteristics of the respondent</u> - Personality - attitudes and beliefs - physical and psychological state - motivation
<u>Contextual and task variables</u> - context and setting for the data collection - confidentiality assurances - instructions and question structure and sequence - questionnaire/interview length - time available to respond - interviewer appearance and manner - recall periods for historical/autobiographical information
<u>Cognitive factors</u> - attention - comprehension - memory organisation and retrieval processes - conscious and unconscious response factors - fatigue

A range of respondent characteristics are likely to influence information exchange, including personality variables (such as anxiety, defensiveness and need for approval), attitudes and beliefs, physical and psychological state, and motivation to engage in the interview process. While it is difficult for the research process to manipulate the first two categories, efforts to ensure that interviews do not take place when the respondent is intoxicated or unwell and endeavours to enhance their motivation to participate can be made.

More open to manipulation are the contextual and task variables identified by Babor and associates (1990). Evidence suggests that self-reports are likely to be valid when confidentiality and anonymity is assured and respondents have nothing to gain or lose from disclosing information (Stephens, 1972; Sobell & Sobell, 1990). It is also important to consider the influence of cognitive factors that precede verbal reports, including attention, comprehension, retrieval, integration and response selection (Babor et al., 1990; Davies, 1992). In order for accurate information to be elicited from a respondent, they must have attended to a request for information, comprehended the question, recalled the relevant information, integrated this information and decided how to respond. If they are tired, bored or unmotivated to comply, the likelihood of success in this endeavour is reduced. Taking these factors into consideration when developing the research instrumentation and protocol are therefore of utmost importance.

A review of studies that have used non-treatment samples was conducted. This resulted in the identification of a number of strategies that have been used to try to increase the accuracy of self-report. Many of these strategies aim to manipulate variables described by Babor and colleagues (1990). Overall, these can be broadly divided into two groups: those that concern the data collection context and process, and those concerning the instrumentation used. Table 2.2 provides a concise summary of these strategies, together with some examples of studies that have used them.

Table 2.2 Summary of strategies used to increase the accuracy of self-reported data on substance use, together with examples of studies that have used them

Strategy	*Examples*
Data collection process	
Stressing confidentiality/anonymity of study.	*Malvin & Moskowitz, 1983;Barnea et al., 1987; Ellickson & Bell, 1990; Spooner et al., 1992; Johnston et al., 1995; Parker et al., 1995, 1998; Botvin et al., 1997;Boys et al., 2000c, 2001a.*
Conducting interview in an informal location (ie not a school or clinic).	*Best et al., 1995; Lenton et al., 1997; Boys et al., 1997; Fountain et al., 1999.*
Ensuring absence of teachers or parents during interview.	*Barnea et al., 1987; Botvin et al., 1990, 1995, 1997; Barnard et al., 1996; Aldridge et al., 1999; Boys et al., 2001.*
Collecting information on sensitive topics during face-to-face interviews using laptop computers.	*Ramsay & Partridge, 1999; HEA/BRMB, 1997.*
Collecting additional external data from other sources (e.g. close friends or family).	*Amsel et al., 1976; Darke et al., 1992.*
Using peers to conduct face-to-face interviews.	*Spooner et al., 1992; Griffiths et al., 1993; Power, 1994; Griffiths, 1998.*
Using a phony objective measure (e.g. a 'bogus pipeline').	*Hansen et al., 1988; Werch et al., 1989; Botvin et al., 1990, 1995.*
Instrumentation	
Incorporating a 'dummy drug' in the list of substances.	*Barnea, et al., 1987; Spooner et al., 1992; Parker et al., 1995; HEA/BRMB 1997; Ramsay & Spiller, 1997; Ramsay & Partridge, 1999.*
Nesting questions on sensitive topics within a broader range of issues.	*Mott & Mirrlees-Black, 1995; Ramsay & Spiller, 1997; Balding, 1997, 1998; Ramsay & Partridge, 1999.*
Verifying consistency in survey items in repeated administrations of a longitudinal survey.	*Barnea et al., 1987; Parker et al., 1995; NHSDA, 1995; Johnston et al., 1995; Boys et al., 2001a.*
Including duplicate items to enable verification of internal consistency across survey items.	*Spooner et al., 1992; Measham et al., 1994; Boys et al., 2001a.*

Strategies that focus on the data collection process or context are mainly concerned with trying to make respondents feel relaxed and motivated to respond accurately. A common approach has been to emphasise the privacy and confidentiality of the data collected when introducing the research to potential respondents. For example, seventh and eighth graders (aged 13-14) participating in Project ALERT (Ellickson & Bell, 1990) received carefully worded explanations regarding the precautions used to protect data privacy, the right to refuse to answer questions if they so wished, and the importance of accurate responses. Other studies have reassured respondents that their answers will not be disclosed to parents, teachers or any other individual outside of the research team (e.g. Boys et al., 2001; Parker et al., 1995, 1998), some have also reassured participants that they will remain anonymous and that no identifying information will be recorded on the questionnaires (e.g. Malvin & Moskowitz, 1983; Boys et al., 2000c, 2001a). These assurances are not only important for ethical reasons, they represent a means of increasing the control that the young person perceives they have over the situation.

In order to maximise the reliability of self-reports, some studies have collected additional information (e.g. collateral reports from family members and other informants, biochemical testing, and official records). A common rationale behind this is that if respondents are aware that additional data are being collected to verify their accounts, they will be more motivated to report accurately. However, not only are such practices costly in terms of both time and resources, the utility with a young population is limited: young people often hide the extent of their substance use from their family members and so collateral reports are unlikely to be helpful. Similarly, it is unlikely that official records would be available to corroborate self-reported substance use for many members of a sample of young people. Another approach has been to use a 'bogus pipeline', (where respondents are led to believe that their breath will be tested for evidence of cigarette and cannabis use) instead of biochemical testing, to try to increase the accuracy of data elicited by making respondents think that their answers will be verified.

Strategies that focus on the instruments used to collect data may also be concerned with trying to motivate accurate responses. Some, such as nesting questions on sensitive topics within a broader range of issues, aim to reduce the emphasis on the potentially stressful measures. However, this approach is not suitable where time is at a premium and the required dataset is complex (such as the studies described in this

thesis). In particular, lengthy interviews run the risk that participants will lose interest and motivation and therefore the quality of the data collected may be compromised.

Other strategies are designed to help detect respondents who are not answering truthfully. These include incorporating a 'dummy drug' into the questions asked and repeating certain items to enable internal consistency to be verified. Respondents who claim to have used a 'dummy drug' or who provide very different answers to two identical items, can then be eliminated from the sample at the analysis stage.

This section has presented evidence that the accuracy and quality of self-report data varies as a function of the methodology used for data collection and the personal characteristics and motivations of the respondent. These issues were considered carefully during the development of the study protocols in order to maximise the probability that the data collected was valid and reliable. The steps taken in the studies described in this thesis to ensure that the validity and reliability of the self-report information obtained was optimised are summarised in table 2.3

Table 2.3 Summary of strategies employed in the three studies to maximise the likelihood of accurate self-reports of substance use

Target	*Strategies*
Enhance motivation	- Explanation of purpose of research - Incentive to participate in interview - Opportunity to discuss/question research - Establishment of a rapport with respondents - Informal and relaxed atmosphere/context of interview - Confidentiality assurances - Interviews conducted away from teacher/parents
Comprehension	- Questions clearly worded and piloted extensively before use - Use of face-to-face interviews to enable respondents to ask for clarification of unclear questions
Accurate recall	- Respondents asked to be drink and drug-free during interview - Use of Time Line Follow Back (TLFB) methods - Need for accurate recall stressed and respondents asked to give no answer rather than provide inaccurate information.

2.7 Summary of methods used for the studies

In this final section of the chapter, a summary of the sampling, design and methods used in the three studies described in this thesis is briefly presented.

The target population for each of the three studies was 16-22 year olds who were not in touch with drug or alcohol treatment services. A cross-sectional survey design was used with respondents recruited using a structured snowball recruitment strategy. A combination of both qualitative and quantitative approaches was used in the research programme. Measures in all three studies included demographics and personal substance use. A core set of background measures was duplicated in each study. Substance use was recorded using three recall periods: lifetime, past year and past 90 days. The recent frequency and typical quantity of substance use was recorded using measures developed by Marsden et al., 1998. Data were collected via face-to-face interviews. Efforts were made to motivate participants by explaining the purpose of the research, offering an incentive to participate, and encouraging them to ask questions about the study. Efforts to maximise the accuracy of self-reported data from the respondents included conducting interviews in an informal and relaxed manner in private where possible, assurances of confidentiality, careful piloting of research instruments and asking respondents to decline to answer a question rather than giving an inaccurate response. The three studies are described in Chapters Three, Four and Five.

CHAPTER 3: A QUALITATIVE STUDY OF FACTORS THAT INFLUENCE SUBSTANCE USE

3.1 Introduction

This chapter describes the first of the three studies designed to identify and model key influences on patterns of substance use in young people. The first step was to identify the main factors to be measured and subsequently used in the statistical models.

3.1.1 Risk and protective factors

A review of the literature (see Chapter One) revealed numerous factors from a range of biological, psychological and social domains that have been associated with drug use and related problems. Factors that are associated with substance use but precede its development have been categorised as 'risk' and 'protective' factors. Risk factors make it more likely that substance use or problems will occur (Mrazek & Haggerty, 1994), while protective factors are associated with a reduced likelihood of the disorder. They have been described as factors which moderate or 'buffer' the association between risk factors and drug use, making an individual more resistent or 'resilient' to the risk (Rutter, 1985, 1993; Clayton, 1992; Brook et al., 1992; Newcomb & Felix-Ortiz, 1992; Stacy et al., 1992; Dunst & Trivette, 1994). Table 1.2 in Chapter One presented a summary of risk and protective factors that research into substance use has identified.

3.1.2 Substance use correlates

In addition to risk and protective factors, the literature also contains a considerable number of possible causes and correlates of drug consumption behaviours (see Prendergast, 1994; Newcomb, 1997; Spooner et al., 2001 for reviews). In contrast to a risk factor, a 'correlate' of drug use has been defined as a factor which co-exists with rather than precedes use (Swadi, 1999). As noted in Chapter One, unlike other psychiatric and medical diagnoses, there is an element of individual control in the development of drug dependence: a drug has to be available and the individual has to *choose* to use it. In the absence of these circumstances, there can be no dependence (Newcomb, 1995; Newcomb & Earleywine, 1996). The importance of intrapersonal factors in this process was highlighted in the literature review: a number of types of

intrapersonal influences were discussed, including those relating to personality, cognitions, and behaviour.

3.1.3 Cognitive factors

A relationship between a variety of cognitive factors and substance use has formed the basis of much investigation over the past two decades. In particular, substance-related expectancies and motivations or reasons for drug use have been studied extensively within the alcohol and drug literatures. Research into expectancies has focused on how the set of beliefs that people hold regarding the impact of a substance on mood, emotions and behaviour, interacts with consumption patterns and intentions. Expectancies have been shown to relate to future use, current use and alcohol-related problems in a range of populations (e.g. Brown, 1985; Stacy et al., 1990; Wood et al., 1992; Werner et al., 1993; Oei & Baldwin, 1994; Henderson et al., 1994).

3.1.3.1 Reasons for substance use

Much of the literature on the relationship between reasons or motivations for use and patterns of substance consumption comes from the alcohol field. Studies that have examined motives for the use of other psychoactive substances are more limited (Johnston et al., 1994; Simons et al., 2000). It has been suggested that studying reasons for substance use may help efforts to predict, explain and understand substance use in all of its forms (Johnston & O'Malley, 1986). Substance users often have differing reasons for taking the same drugs (Segal, 1986) and reasons for use may differ between different drug types (Robbins et al., 1970; Lombillo & Hain, 1972; Segal et al., 1980, 1982, 1983; Segal, 1986; Johnston & O'Malley, 1986). However, there is a certain amount of commonality in reasons or motives across different drug types (Newcomb et al., 1988; Simons et al., 2000; Schafer & Brown, 1991). Reasons for use have also been found to relate to patterns of consumption (e.g. Mulford & Miller, 1960; Carman, 1979; Johnston & O'Malley, 1986; Newcomb et al., 1988; Smith et al., 1993; Graham et al., 1996; Cronin, 1997; Williams & Clark, 1998; Simons, 2000) and problems associated with use (e.g. Carman, 1979; Johnston et al., 1985; Connors et al., 1990; Klein 1992; Simons et al., 2000).

There is some suggestion of gender differences in the types of reasons or motivations for substance use reported by males and females (e.g. Edwards et al., 1973; Ratliff &

Burkhart, 1984; Carman & Holmgren, 1986; Orford & Keddie, 1985; Klein 1992; Wood et al., 1992; Billingham et al., 1993; Dunne et al., 1993; Beck et al., 1995). For example, Newcomb and colleagues (1988) reported that males used cannabis to enhance positive affect and creativity in contrast to female respondents who were more likely to use this drug to reduce negative affect. In another study, Novacek and colleagues found that female adolescents reported more coping reasons for drug use while male respondents endorsed more pleasure reasons (Novacek et al., 1991).

Limitations identified in the literature on reasons and motivations for substance use include a tendency for reasons for all illicit substances to be grouped together (e.g. Robbins et al., 1970; Kamali & Steer, 1976; Carman, 1979; Butler et al., 1981; Segal, 1985-86; Novacek et al., 1991; Cato, 1992; Buchanan, 1993) or for a simple distinction between cannabis and an unspecified global category labelled 'hard drugs' to be made (e.g. McKay et al., 1992). Other studies have grouped reasons reported by users with hypothetical reasons reported by non-users (e.g. Weinstein, 1976; Reeves & Draper, 1984; Novacek, et al., 1991; Buchanan, 1993): this is likely to bias results towards non-users' perceptions of why other people engage in drug use rather than actual reasons for use. Finally, there has been a degree of inconsistency as to what exactly counts as a 'reason' for substance use, with some studies using what could be described as expectancy items (e.g. Cronin, 1997). The term 'function' has also been used in the literature, although this has been less widespread. The dictionary defines a 'function' as "the natural action or *intended purpose* of a person or thing in a specific role" (emphases added) (Collins English Dictionary, 2000). Chapter One argued that the use of this term is more exact and therefore preferable to 'reasons' or 'motivations'.

3.1.4 Peer substance use

Peer substance use has been widely identified as an important influence on drug use in young people (Kandel et al., 1978; Huba et al., 1979; Battistich & Zucker, 1980; Jessor et al., 1980; Elliott et al., 1985; Kandel, 1985; Barnes & Welte, 1986; Kandel & Andrews, 1987; Lopez et al., 1989; Brook et al, 1990; Swadi, 1988, 1999). This relationship has a history of being interpreted as arising because peers 'pressurise' each other into substance use (Swadi & Zeitlin, 1988; Glassner & Loughlin, 1987). However, evidence for this argument is limited. Alternative explanations for the strong correlations observed between individual and peer use have included a process of 'peer

influence' (Oetting & Beauvais, 1986), 'peer selection' or 'peer projection' (e.g. Fisher & Bauman, 1988; Bauman & Ennett, 1994). For example, Hart and Hunt (1997) highlighted the importance of recognising peer selection and socialisation in the relationship between individual and peer substance use. They stressed the active role of the young person in deliberately choosing to engage in substance use. Similarly, Wibberley (1997) recognised the importance that the peer group has in supporting substance use as well as considering the importance of individual choice. Other studies have noted the importance of the peer group in defining and shaping certain boundaries around what is regarded as acceptable substance-using behaviours (e.g. Glasner & Loughlin, 1987; Power et al., 1996). The importance of boundaries set by the peer group is a central theme in Oetting and Beauvais's 'peer cluster theory' (Oetting & Beauvais, 1986, 1987). The theory asserts that psychosocial factors impact on the choice of friends and contribute to the peer group norms concerning substance use and thus have an indirect influence on an individual's drug use. In other words, the influence that these factors have on drug use is mediated by the peer cluster that exerts the strongest and most proximal influence of all (Dinges & Oetting, 1993).

3.1.5 Qualitative research

It was considered unrealistic to attempt a comprehensive measurement of all of the factors identified in the literature as associated with substance use. Furthermore, evidence that the impact of certain factors is influenced by culture was apparent (Morgan et al., 1999) and it was unclear to which variables in the literature this might apply, given that much of the research which has been considered was North American. It therefore seemed appropriate to commence the research programme with a small exploratory study to identify the most salient influences on drug use as described by a group of young substance users. This process would then inform the identification of domains and measures for subsequent use in the two quantitative studies. Qualitative methods were selected for this first study for two reasons. Firstly, as discussed in Chapter Two, they enable an inductive approach to be used in the absence of a predetermined agenda and can help to inform the selection of measures for quantitative investigation (Rhodes et al., 2000). Secondly, this type of research approach is particularly appropriate for gathering data on behaviours from the perspective of the drug user (McKeganey & Barnard, 1992; Rhodes, 1995, 1997; Power, 1995; Rhodes et

al., 2000). There is a long tradition of qualitative research in the field of drug use in the UK (Griffiths et al., 2000). The following paragraphs provide an overview of some recent studies conducted in the UK, that have adopted this type of approach.

Qualitative research methods are well suited to gathering data from hidden populations and are therefore ideal for researching illegal behaviours such as drug use within marginalised sections of the population. Examples of qualitative drug research conducted in the UK during the past decade include studies of drug users involved in street prostitution (McKeganey & Barnard, 1992), female injecting drug users (Taylor, 1993), prescription drug users (Fountain et al., 1998, 1999), heroin users (Power et al., 1993, 1995a) and crack and cocaine users (Power et al., 1995b). A variety of studies have specifically focused on young drug users but again often examining relatively uncommon behaviours such as heroin, ecstasy or cocaine use (e.g. Pearson, 1987; Parker et al., 1988; Henderson, 1993; Boys et al., 2000b, 2001c).

During the last decade, as drug use has become more widespread and in many ways less marginalised among young people in the UK, qualitative studies have also examined drug use in 'normal' populations of young people. Studies that fall into this category have either sampled young people through educational establishments (e.g. Parker et al., 1998; Wibberley, 1997; McMillen, 1997) or have used purposive samples of young people from the general community (e.g. Young & Jones, 1996; Power et al., 1996; Hart & Hunt, 1997; Fountain et al., 1999). These studies have covered a wide range of topics and issues, including drug-related experience, knowledge and values (Young & Jones, 1996), feelings about drugs and reasons for use (Wibberley, 1997), and the social dynamics of drug offers and related decisions (Hart & Hunt, 1997).

3.1.6 Study aims

In the light of the previously described research, the main aims of this first study were as follows:

i) To identify the most salient influences on substance use as described by a group of young substance users.

ii) To examine the role of peers in influencing substance use.

iii) To identify specific functions (reasons) for substance use.

In addition to these three aims, the study provided the opportunity to examine patterns of polydrug use in a sample of young people and to identify the drugs most commonly used. The qualitative approach to data collection enabled the study to be explorative and unrestricted by a pre-determined response framework.

3.2 Methods

The study was conducted between June and September 1997. A total of 40 young people between the ages of 16 and 22 were interviewed[1] (including two pilots). A semi-structured, face-to-face interview was used to explore aspects of respondents' drug and alcohol use and how their behaviour related to that of their peers. This section details the method and procedures employed to gather data for the study.

3.2.1 Pilot interviews

Two pilot interviews were conducted prior to the main study. The first was with a 19-year-old female and the second with a 21–year-old male, both of whom were acquainted with colleagues of the author. Interviews lasted almost two hours and were based on a semi-structured interview schedule covering the following:

i) Substance use history

ii) Typical current patterns of substance use

iii) Factors perceived as influencing general patterns of use (both increases and decreases)

iv) Factors perceived as influencing specific drug-related decisions

v) Functions served by use of different drugs

vi) Peer substance use

The above question areas were repeated for each drug that the respondent reported having ever used.

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[1] *These interviews have been separately analysed and published elsewhere: Boys, A., Marsden, J., Fountain, J., Griffiths, P., Stillwell G., & Strang J. (1999b). What influences young people's use of drugs? A qualitative study of decision-making. Drugs: Education, Prevention and Policy, 6 (3), 373-389 (see appendix E).*

Interviews were tape-recorded, transcribed and then examined to facilitate the revision of the interview schedule for the main data collection phase of the study. The most problematic finding from the pilots was the length of time taken to complete the interviews. In order to reduce the time taken, a short interviewer-administered questionnaire was designed to collect basic demographic data and to profile drug-use experience at the start of the interview (see appendix B). This took the form of a series of closed questions that allowed the interviewer to cover a range of discussion topics quickly and efficiently. An added advantage of using this brief questionnaire was that it provided the researcher with a concise 'drug-use profile' for reference throughout the interview. This helped the researcher to tailor questions to the individual's experience, thus making the interview more personal.

Analysis of the pilot interviews also indicated that there would be substantial variation in interview length between respondents who had only used one or two drugs and those with more extensive drug-use histories. To reduce the likelihood of interviewee fatigue in such interviews it was decided that discussions would focus on the three substances identified by respondents as their 'main' drugs. Details pertaining to use of other drugs would be collected only if time allowed. The aim was to complete each interview in approximately one hour as this was thought to be sufficient time to allow a detailed discussion to develop, but not protracted enough to risk leading to fatigue.

3.2.2 Participants

The sample consisted of 40 young people (21 males and 19 females) recruited from and living in the London metropolitan area. Respondents were recruited using snowballing techniques to obtain a range of ages, occupations (and thus incomes) and social backgrounds. The two inclusion criteria for participation were (a) aged between 16 and 22 years; and (b) lifetime use of at least one illicit drug. Potential respondents were excluded from the study if they had any history of drug or alcohol treatment.

Participants were recruited by snowball sampling with a number of starting points: an ecstasy dealer, a waitress, a student nurse, a university student and a college student. These were recruited by word of mouth via colleagues and three professionals working with young people (a teacher and two youth workers). Each individual was asked if they would be willing to explain the purpose of the study to friends who

fulfilled the inclusion criteria and then introduce those who expressed an interest to the researcher. All participants were informed that the data collected was both anonymous and confidential and that participation was voluntary.

3.2.3 Instruments

In order to minimise the length of the interviews a short questionnaire was administered before the main interview. This was devised as a parsimonious means of recording demographic information and profiling substance use. This section describes the structure of this brief questionnaire and the main interview schedule.

3.2.3.1 The brief pre-interview questionnaire

The questionnaire recorded demographic characteristics (i.e. age, gender, ethnicity, current occupation, income) and consumption patterns for cigarettes and five other substances (alcohol, cannabis, amphetamine sulphate, LSD and ecstasy). These five drugs were selected as they are generally estimated to be most prevalent in the target age group (Ramsay & Spiller 1997; HEA/BRMB 1997; Ramsay & Partridge, 1999).

Three recall periods were used to describe substance involvement: the respondent's whole lifetime, the past 12 months and the past 90 days (see section 2.5.2 for discussion relating to recall periods). Respondents were first asked if they had 'ever' used a particular substance and, if so, their age at the time of first use. The total number of occasions of lifetime use was then assessed by asking participants to choose one of a list of categories from a prompt card. The category options were as follows: once only; 2-10 times; 11-20 times; 21-50 times; 51-100 times and more than 100 times. Respondents were then asked if they had used the drug in the last year (coded yes/no) and in the last 90 days (coded yes/no).

As discussed in Chapter Two, for the purposes of this thesis, 'current use' is defined as consumption within the 90 days prior to interview. Respondents were first asked to estimate the number of days on which they had used the drug out of the past 90 days, using a prompt card to facilitate responses (e.g. one day per week = 13 days in total – see appendix C). This card was only intended to serve as a guide and respondents were invited to report an alternative number if this was not indicated on the prompt card. In order to record the typical amount used, interviewees were asked to estimate the average quantity that they had used on a 'typical using day' during the last

three months. The quantity consumed was recorded verbatim from their reports in terms of weight (grams or ounces), cost, or doses ('pills', 'joints 'or 'lines'). Answers were followed up to establish as accurate an estimate of amount as possible. For example, if the first response was "£10 worth", clarification in terms of weight was requested to double check that the two responses were consistent with current street prices (as listed on http://www.idmu.co.uk/cp8.htm). At the coding stage, responses were converted into standard units (for alcohol), grams (for cannabis, amphetamines and cocaine) or pills/tabs (for ecstasy and LSD) to render them meaningful for analysis. If a respondent had difficulty in recalling the amount of a substance that they had used on a 'typical' using day, an averaging method was used. Here, they were asked to recall the amount used on the three most recent using occasions and an average of these three amounts was then recorded.

3.2.3.2 The interview schedule

The semi-structured interview schedule was designed to act as a guide rather than a rigid structure for the interviews. This allowed the interviewer the flexibility to respond to topics of interest as they spontaneously arose during interviews, thus enabling a relaxed, conversational style to be adopted. Respondents were encouraged to give as much information as they wanted to in response to questions, and answers were probed to maximise detail. Prompt cards listing the names of various drug types were used to facilitate discussion.

3.2.4 Procedure

Interviews were conducted by the author in informal community settings selected by the interviewee (such as a private house, a park or café). Before each interview commenced the interviewer explained the purpose of the study, provided the respondent with a printed information sheet about the study (see appendix D) and gave the respondent the opportunity to ask questions about their participation. All interviews were tape-recorded, with the interviewee's consent, and subsequently transcribed. This method was chosen to create an informal atmosphere in which fuller responses were more likely to be given than if data were written down in front of the respondent. There was no evidence that this method compromised the quality or quantity of the data collected: no participant refused to allow the interview to be recorded and they all appeared to forget

about the presence of the tape-recorder quickly. Each participant was reassured that the tapes and the questionnaires would remain anonymous, with only a code number to link them, and that no one other than the author would have access to the data. Respondents received expenses for travel and compensation for the time they spent being interviewed.

3.2.4.1 Ethical considerations

In order to ensure that the study was conducted appropriately and according to accepted ethical standards, a proposal detailing the context, research objectives and research protocol was submitted to and approved by the Bethlem and Maudsley NHS Trust Research Ethics Committee.

At recruitment, potential participants received verbal and written information regarding the purpose of the research study. The reading age of the written information was assessed using the Flesch-Kincaid Grade level statistics from Microsoft Word '97 to ensure that it was appropriate for grade six (aged 12 years). The author confirmed that the respondent had understood the information before continuing. If problems were encountered in reading any part(s) of the information sheet, the author read it aloud to the participant and discussed it where necessary. It was stressed that any data collected would be confidential and anonymous, with only a code number to link the questionnaire and tape, and that no identifying information about the respondents would be recorded. Potential respondents were informed that participation in the study was voluntary and that they were free to terminate the interview at any point should they so wish. All respondents were given adequate time to consider whether or not they wished to participate in the study before they were asked to give consent. At the start of the interview, the participant was asked if they had any questions regarding the study. After dealing with any questions arising, the tape recorder was switched on and the following paragraph read aloud to the participant:

> *"It is important that you understand that you have the right to terminate the interview at any point or to refuse to answer any questions that you do not wish to answer. Could you confirm for the tape that you understand this and still wish to continue with the interview?"*

Verbal consent was then obtained from the participant on the tape. Unlike using a consent form, which needs to be signed by participants, this process enabled consent to be given anonymously. To ensure that the tapes could be matched to the corresponding questionnaires, they were assigned matching identification numbers. At no point was the name or any other identifying information recorded about the interviewee. A similar protocol was adopted for Studies Two and Three (see Chapters Four and Five).

3.2.5 Validity and interpretation of the data

The interview schedule was designed to include cross-checks for answers from the pre-interview questionnaire and therefore highlight any inconsistencies in self-reported substance use. For example, an open-ended question was used to verify the number of occasions of recent substance use reported in the initial questionnaire. On the rare occasions when an inconsistency between answers was identified it was raised with the participant and they were asked to clarify which of their answers was the most accurate. Where necessary, parts of the brief questionnaire were repeated to ensure that the data collected were as accurate as possible. In the few cases that this was required, it was due to the conversation in the interview having prompted the respondent to remember a forgotten occasion when substance use had occurred. This suggests that data from the brief questionnaire are more likely to reflect under-reporting than over-reporting of substance use.

3.2.6 Data analysis

The transcriptions of the qualitative interviews were analysed using a combination of content-based analytic methods and grounded theory (Glaser & Strauss, 1967; Patton, 1990; Smith, 1995). Essentially this meant that inferences could be developed from the data without being restrained within a pre-existing theoretical structure. Grounded theory is a methodological approach to qualitative data analysis that develops theory or models through continuous comparisons between data collection and analysis (Glaser & Strauss, 1967). Data analyses started early on during the fieldwork stage and preliminary findings were used to inform subsequent interviews. Initial interviews identified the issues that were significant to individuals from the drug-using networks under study. These issues were then explored in greater depth in subsequent interviews, where appropriate. Both the research process and findings were grounded in the data

rather than in a pre-set itinerary and were guided by issues that were raised by the respondents in addition to the priorities of the study.

In the first stage of the analyses, initial transcripts were read through several times by the author and a list of potential key themes noted down. These were then numbered sequentially. Subsequent transcripts were then examined in relation to the already identified themes and the relevant code numbers noted in the margins. The list of themes was re-examined and revised where necessary with reference to the transcripts. Two independent raters verified these coding decisions. Any disagreements were then discussed and resolved. Theme labels and categories were sometimes merged or further subdivided. For example, the theme of 'peer substance use' was later further categorised according to whether quotes referred to a 'best friend' or 'partner' or the wider peer group. Once all the transcripts had been coded, the relevant text for each theme was saved in a word-processing document together with the code number, gender and age of the respondent. A separate file was used for each major theme heading. Some quotes were relevant to more than one theme and were therefore saved in several relevant files.

The structure of the results presented below reflects the themes identified during the analyses. Throughout the analytical process, detailed notes were made regarding the associations between different sections of text. Frequent references were made to the original transcripts to ensure that quotations were not misinterpreted or taken out of context.

3.3 Quantitative results

The results from this study are presented in two sections. The first is concerned with describing the sample in terms of their demographics and substance use history. These data were gathered using the quantitative pre-interview questionnaire. The second section (section 3.4) examines the qualitative themes and content from the main interviews.

3.3.1 Demographics

The average age of the sample was 18.7 years (range 16-22 years). Eighty percent were white European, while the others were black, Asian, Chinese or mixed race (5% each).

Seventeen (43%) were currently in some form of education, 13 (33%) had full-time work and the remaining quarter was unemployed. Estimate of weekly disposable income ranged between £15 and £150 (mean = £69, mode = £53)[1].

3.3.2 Substance use

All respondents reported lifetime use of alcohol, cigarettes and cannabis. In addition, a substantial proportion had tried amphetamines (33, 87%), ecstasy (27, 68%) and LSD (20, 50%). Chi-squared tests and *t*-tests did not reveal any gender differences in lifetime substance use. Those who reported lifetime use of ecstasy and LSD were significantly older than non-users (19.6 vs 17.0 years $t_{[38]}$=5.26, p<0.001; 19.6 vs 17.9 years $t_{[38]}$=3.08, p<0.01 respectively). The substance-use history of the sample is summarised in table 3.1. The table also summarises data on the age of first use, number of times ever used and use in the past 12 months for each drug type.

Table 3.1 History of substance use (n=40)

Substance	*Lifetime use*	*Mean age of first use*	*Used > 20 times (% of lifetime users)*	*Used in last 12 months (% of lifetime users)*
Cigarettes	40 (100%)	13.2 (7-18)	36 (90%)	35 (88%)
Alcohol	40 (100%)	13.5 (11-18)	37 (93%)	39 (98%)
Cannabis	40 (100%)	14.6 (10-18)	36 (90%)	37 (93%)
Amphetamines	33 (87%)	16.0 (13-19)	18 (55%)	27 (82%)
Ecstasy	27 (68%)	16.8 (13-19)	13 (48%)	23 (85%)
LSD	20 (50%)	16.3 (12-20)	8 (40%)	10 (50%)

Most respondents had first tried alcohol and cigarettes when they were 13 years old, cannabis at 14 and then the three remaining drugs around the age of 16; *t*-tests did not reveal any gender differences in the age of first use for any of the drugs.

[1] *Three respondents estimated their weekly disposable income to be £420, £300 and £250 respectively. These outlying values were recoded to the next highest value recorded (£150) to give a more representative mean score for the sample.*

Virtually all of the lifetime users of cigarettes, alcohol and cannabis estimated that they had used these substances on at least 20 separate occasions. Just one drug was found to differ by gender on this variable: males were significantly more likely than females to have used LSD more than 20 times ($\chi^2_{[1]}=8.89$; $p<0.01$).

More than 80% of the lifetime users of all the drugs (except LSD) had used these drugs within the year prior to interview. Only half of those who had ever tried LSD indicated that they had used this drug within this time period. There were no significant age or gender differences in the proportion of lifetime users who had used within the 12 months prior to interview with the exception of amphetamines where females were significantly more likely to have done so than males ($\chi^2_{[1]}=6.90$; $p<0.05$).

Table 3.2 summarises the recent patterns of substance use reported by the sample. The most popular substances were alcohol, cigarettes and cannabis – all used by over 85% of the sample within the three months prior to interview. The next most common drug was amphetamines (n=21), used by 53% of the sample, followed by ecstasy (17, 43%) and LSD (10, 20%). The table also shows the mean frequency and typical amount used for each substance.

Table 3.2 Summary of recent patterns of substance use reported by the sample (n=40)

Substance (lifetime users)	*Used in past 90 days*	*Mean days used in past 90 days (range)*	*Amount used on a typical using day in past 90 days*
Cigarettes (n=40)	35	80.3 (1-90)	13.8 (1-30)
Alcohol (n=40)	36	37.9 (1-90)	9.9 (1-26)[a]
Cannabis (n=40)	35	54.1 (1-90)	5.3 (1-25)[b]
Amphetamines (n=33)	21	11.4 (1-39)	1.3 (0.3-2.5)[c]
Ecstasy (n=27)	17	14.8 (1-51)	1.6 (0.5-3.0)[d]
LSD (n=20)	8	11.9 (1-30)	1.9 (0.5-3.0)[d]

[a] = units (1 unit = 8g ethanol approx.); [b] =number of cannabis cigarettes (or 'joints'); [c] = grams; [d] = tablets/tabs.

There were no significant gender differences in the frequency of use of any of the six target substances during the 90 days prior to interview. Significant gender differences in the amount consumed on a typical using day were observed for cannabis

(mean for males = 7.26, mean for females = 2.80, $t_{[32]}$=2.89, p<0.01) only. The following paragraphs summarise patterns of use for each drug type.

Alcohol

Frequency of recent alcohol use ranged from one occasion only (two people) to every day (four people). A fifth of the sample reported drinking less than once a week during this time period, nine respondents drank once or twice a week and 11 estimated that they had drunk alcohol on 3-5 days per week. A third of the sample reported drinking more than 10 units on an average drinking occasion.

Cannabis

Frequency of recent cannabis use ranged from one occasion only (one person) to every day (eight people). The majority of respondents who had used cannabis during the past 90 days had done so at least once a week (33, 91%). The typical number of cannabis cigarettes (or 'joints') smoked in a day ranged from one to 25, with a mean of 5.3.

Amphetamines

Amphetamines were generally used less frequently than cigarettes, cannabis or alcohol. Seven respondents had used amphetamines less than once a month in the last 90 days, six had used between one and three times a month and seven were using at least once a week. The amount consumed on a typical occasion ranged from a third of a gram to two and a half grams.

Ecstasy

The frequency of ecstasy use ranged from once in three months (one person) to four times a week (two people). Six people estimated that they were using the drug once a week or more often at the time of interview, seven that they were using between one and three times a month and the remaining three less than monthly. Respondents consumed between half a tablet and three ecstasy tablets on a typical using occasion, with an average of 1.6 tablets.

LSD

Frequency of LSD use during the 90 days prior to interview ranged from one occasion only (two people) to thirty times in total (two people). Three people estimated that they had used the drug at least once a week during the past three months. The average amount consumed on a typical using occasion during this time period was 1.9 tablets (range 0.5-3.0).

3.4 Qualitative findings

Analysis of the interview transcripts highlighted several factors that influenced drug use. The complexity of interactions between these factors was particularly evident in the data and they did not fall neatly into independent categories. It is therefore important to note that the categories are not mutually exclusive, rather they interact in important and complex ways. The findings are structured according to demographic, social environmental and individual influences, as follows.

3.4.1 Demographic influences

As discussed in Chapter One, gender differences in the prevalence of substance use have been widely documented in the literature (HEA/MORI 1992; Measham et al., 1994; Johnston et al., 1994; Mott & Mirrlees-Black, 1995; HEA/BRMB, 1997; Ramsay & Partridge, 1999), although there is some evidence from recent surveys that this gap has reduced (Parker et al., 1995, 1998; Balding, 1997, 2000; Egginton et al., 2001).

Participants were asked whether they thought there were any differences in how the males and females in their social groups used drugs and alcohol. The only consistent differences reported were in the quantities consumed. Males were reported to drink more alcohol than females and smoke more cannabis on a typical using occasion. This could be explained partly by the average greater body mass of males, as there was no general consensus that males typically became more intoxicated than the females. As one 17-year-old female commented:

> *The blokes we go around with smoke a lot more gear (cannabis) and do a lot more speed because they seem to be able to handle it better – they don't get more out of it, just get about the same as us. (Female aged 17).*

Several of the younger respondents (16 and 17 year olds) suggested that the females of their age generally drank more heavily than their male peers, who smoked cannabis instead. One male respondent offered an explanation for this. He thought that because his female peers tended to look older, they could purchase alcohol more easily than males of the same age. In contrast there was no age limit to purchasing cannabis. An alternative theory, provided by several respondents, was that the effects of cannabis appealed more to males and that females preferred the effects of alcohol. There was some suggestion that females were more inclined to feel anxious after smoking cannabis than the males, but more confident after drinking alcohol. This is illustrated in the following assertion:

> **Respondent (R):** *All the girls we hang around with will out-drink any of the boys...but that's 'coz we smoke instead.*
>
> **Interviewer (I):** *Is that the reason, because you smoke cannabis and they drink?*
>
> **R:** *Yeah, I mean, they puff [smoke cannabis] as well, but it's not really their sort of thing ... A lot of girls just don't like the feeling of it as well, 'coz girls around boys normally get quite anxious anyway 'coz they're worried about their appearance and all that and on draw as well, it's even worse 'prang' [paranoia] whereas on beer and alcohol they can be loud and they don't really care. (Male aged 16)..*

In contrast, a female from the same peer group offered the opposite interpretation: that these differences were due to the boys being unable to 'handle' the effects of alcohol.

> *The boys don't drink half as much as us girls ... they actually don't drink much at all 'coz they're mostly into draw [cannabis] and they can't handle it [alcohol]. They seem to get ill quicker than the girls, they try and show off drinking a lot at one time and then get sick and make fools of themselves. So, they don't do it as much in front of us. (Female aged 16)..*

This belief that males and females prefer different types of drug effects also emerged in several interviews with older respondents. Females were described as preferring physical effects, such as an increase in energy, to the hallucinations or perceptual distortions enjoyed by the males. A 20-year-old male respondent explained that:

R: *...girls tend to like speed more because it's a totally physical thing, it just wakes you up, makes you do more stuff and it doesn't affect your mind in any way. Girls don't like more of the psychoactive drugs like acid ... because it just messes with your head too much.*

I: *Why do you think they don't like that?*

R: *I think at the end of the day they just prefer to be more in control. I don't mind being in a situation where I don't know what I'm doing, I don't know what's going on and I've totally lost it and I get all confused ...but I think it might worry them. (Male aged 20).*

Another male of the same age reported similar opinions concerning females and LSD use:

I: *Do you think there are any differences in how males and females use drugs or alcohol?*

R: *Definitely - in quantity and reasons and types ... women are more cautious and will take less than men. Women generally like to stay in control a lot more and tend to stay away from drugs like LSD and don't take it in anywhere near the amounts that we take it in, simply because they don't like the feeling of being completely out of control. (Male aged 20).*

Several female respondents shared these views. The following quotation from a 19-year-old female ecstasy dealer illustrates this:

Blokes my age tend to want to do more acid and magic mushrooms and all that hallucinogenic stuff rather than ... If I go out sometimes I do want to get completely fucked, but however much I will still have that control in it - I mean sometimes I think - oh I don't really care, but I'm still in control. (Female aged 19).

The idea that females preferred to stay in control was a recurring theme in the interviews. Hart & Hunt made similar observations in their study of 11-16 year olds in Kent (Hart & Hunt, 1997). They reported that females in their sample tended to be more cautious about their drug-decisions than males and their social role often included more of what the authors describe as a 'carer element'. In contrast, the males tended to be more involved in obtaining the drugs, which the authors interpreted as a more 'masculine' role due to the risk-taking involved. A crucial influence on obtaining drugs

that was cited by both genders was availability. This factor is discussed in the next section, which focuses on social and environmental factors identified in the data.

3.4.2 Social Environment

3.4.2.1 Availability

The influence of availability on substance use has been widely documented (Gorsuch & Butler, 1976; Gottfredson, 1988; Maddahian et al., 1988; Teichman et al., 1989; Barnea et al., 1992). Measures to reduce the supply of certain drugs is a key objective highlighted in the UK anti-drugs strategy (UKADCU, 2000). Recent estimates suggest that more than 75% of the total amount spent on drug interventions is allocated to supply reduction activities compared with just 13% to treatment, making it the most costly of all anti-drug initiatives (Royal College of Psychiatrists, 2000). However, these efforts appear to have achieved only a modest impact on the availability of drugs on the street in the UK. While the availability of a drug is a necessary condition it is not in itself sufficient for use to occur, as an individual may choose to abstain from an available drug or choose an alternative substance.

Availability was commonly mentioned in the interviews as a crucial influence on substance use. Of particular note was the finding that if a drug of choice was not available this did not necessitate abstinence from use. Instead it was not uncommon for a substitute drug to be consumed instead. For example, some interviewees noted that although their first choice of stimulant if they were going out to a nightclub tended to be amphetamines, if this were unavailable they would choose ecstasy instead. For others who preferred ecstasy, the opposite was true:

> *Speed, that would be my priority and I would only take 'E' [ecstasy] if I couldn't get it. (Male aged 18).*

Similarly an 18-year-old female commented:

> *I only use speed in like dire emergencies when I like really feel like doing some drugs and there's no 'E' around. (Female aged 18).*

There was also evidence that many of the young people interviewed had certain trusted sources for drugs. If their drug of preference was unavailable through these channels,

this might influence them to abstain on that particular occasion rather than making a purchase from another unknown source, such as a dealer in a nightclub.

The availability of certain illicit drugs not only seemed to influence whether individuals chose to use them or not, but also influenced the intensity and frequency of their use. As a 20-year-old male explained:

> **I:** *What do you think have been the major influences on your use of speed [amphetamines] since you first tried it?*
>
> **R:** *I think the biggest influence has probably been availability ... because when you're at that sort of age - 17/18 - if you can get it, you'll have it, because you don't think about the consequences much, I mean, if I had stumbled across a dealer, I would have ended up in a right state probably. (Male aged 20).*

One 19-year-old female described a time a few years earlier when she had found herself in a situation where amphetamines were very readily available:

> *When I was 16 I used to live in a dealer's house and for about a year and a half I was constantly taking it, I mean not every single day, but the majority of days, because I didn't have to pay for it and it was there on a plate for me. (Female aged 19).*

Both of the above excerpts suggest that at least at certain ages, easy availability of a drug of choice could have a pronounced impact on patterns of use. However, in contrast, there was no evidence from interviews with older respondents that ease of availability had had a major impact on the regularity of their current use.

Peers were also identified as a major source of drugs. However, the relationship between the peer group and individual substance use is complex and is discussed separately in the following section.

3.4.2.2 Peer substance use

When asked to describe their social circle it was not unusual for people to report that they socialised with more than one group. The size of these groups ranged from around five people to 40 or more. Each respondent was asked to characterise the drug and alcohol preferences and general behaviour of their friends and peers. Although it was

common to have close friends whose substance-using patterns were similar to their own, many also reported that they had friends who had quite different patterns of use:

> **I:** *Do you use the same sort of drugs as the rest of your friends?*
>
> **R:** *I think so. Probably some of my friends use a lot more cannabis than I do and smoke it on a more regular basis... but some do less as well, so I'm sort of in the middle. I've got friends who use ecstasy and do acid as well but I've also got friends who do nothing at all. (Female aged 18).*

Another female respondent emphasised how her personal substance use differed from that of her friends:

> **I:** *Does what the people you are with are using affect what you use?*
>
> **R:** *Sometimes, but not generally. I'm a bit of a strong character anyhow - I won't use what everyone else is using - I'll do what I wanna do.*
>
> **I:** *Do your friends use the same drugs as you?*
>
> **R:** *Yeah - except that most of them smoke and take acid and I don't. (Female aged 19).*

Some people differentiated between circles of friends according to their drug or alcohol use, referring to non-drug users as their 'straight friends'. One participant described how she tailored her own drug use to fit into the group norms of those with whom she was socialising.

> *I won't take pills [ecstasy] if I'm seeing my straight friends 'coz I don't think it's fair. (Female aged 21).*

Although peer use was described as closely related to personal patterns of use, respondents did not generally view their peers as exerting 'pressure' on their drug use decisions. Although the concept of 'peer pressure' was frequently mentioned (without prompting), this was almost always because the interviewees disagreed with the idea. The prevailing opinion was that substance use was engaged in through personal choice rather than as a result of social pressures. As respondents explained:

R: *A couple of friends have said "you know we're getting some E's would you like some?" but there's been no pressure or anything it's just been just asking. (Female aged 18).*

I: *Do you think that their use (friends) has effected what drugs you use or don't use?*

R: *Probably does affect you a bit but I'm not pressurised or anything. If I don't want to do it they're not going to pressurise me into doing it. Like sometimes if other people are doing it and I don't want to they don't say "go on" because we're not like that. (Female aged 16).*

Another young female reported similar experiences:

> *I've had the opportunity to use it [ecstasy] but I never have so far, but I'm around it like all the time ... but they don't push me or nothing. (Female aged 16).*

Overall, the data suggest that friends definitely influence drug use but there was little evidence to support the idea of 'peer pressure'. In particular, peers often provided the opportunity to use drugs and a supportive environment in which to experiment. The importance of a supportive environment was particularly stressed in association with using hallucinogens such as LSD:

> *I would never want to be in a club [when using LSD] because of the paranoid side of it, I'd rather be round a friends house and all of us take it. I would not like to take it on my own, I'd want everyone to be using the same drug and experiencing the same kind of thing as I was. (Male aged 18).*

A 20-year-old female expressed similar feelings:

> *I don't believe that you should do trips unless you are in a close circle of friends who you really trust ... sometimes I think, maybe I'd like to try one again, but I don't seem to have the people around that I would feel safe and confident in doing them with. (Female aged 20).*

These two excerpts highlight the significance that environmental context played in decisions to use drugs such as LSD. In the latter quote, the respondent notes the importance of being with close friends when using this drug. It was also common for female respondents, in particular, to express a preference that they were always with a

close friend when using ecstasy or amphetamines, as the following quote from a 19-year-old woman illustrates:

> *I don't like to do things on my own. I like to have at least one person on my wavelength, otherwise I might get paranoid. If I do an 'E' or whiz [amphetamines] it's normally with a close friend. I want to go out with someone who I trust in case something does go wrong, you know, if I had a bad reaction. (Female aged 19).*

Close friends or 'best friends' had played an important role at initiation into the use of a particular drug for some respondents. Once again these were all female:

> *When I first tried speed, we went out clubbing, me and my best friend did it together ... You know, "Anything wrong? Then I'll take you home and everything" (Female aged 21).*

This particular respondent had also been with her best friend when she first tried ecstasy:

> *She [best friend] phoned me up one day. I had just finished a really long shift ...she phoned me up and said her boyfriend had some ecstasy there and was offering it to her but she wouldn't take it unless I came down. She was in London at the time and so I got changed and got a train down! (Female aged 21).*

In addition to best friends, some mentioned that their own personal drug consumption was strongly affected by that of their partner. This influence appeared to operate in both directions: promoting or inhibiting use. For example, a 20-year-old male described how his decisions to use ecstasy were often affected by his girlfriend's drug-related decisions:

> **I:** *When you go to clubs with your girlfriend, does she usually have something?*
>
> **R:** *Not very often - but she will every now and again.*
>
> **I:** *Does that affect whether you do anything?*
>
> **R:** *No ... well, it might in that sometimes if she's not, then I'll make a decision - I'll think "No, I'm not, 'coz I don't want her to feel left out". (Male aged 20).*

Another respondent noted how her relationship with her partner had influenced her substance use:

> *I hadn't really done many drugs when I met [my boyfriend], just dope [cannabis] and drink, but him being there and using stuff made it seem safer. I've only ever used stuff like ecstasy and trips [LSD] with him there, 'coz I know he'll look after me if I have a bad time or something. (Female aged 20).*

In some cases, the influence of a 'best friend' or 'partner' seemed to be similar, providing a nervous user with support and the reassurance that in the event of a bad reaction someone close to them would be there to look after them.

Some researchers have suggested that young people choose to make friends with people who share their own sorts of values and behaviours ('peer selection') or that people who are friends tend to become more alike in these dimensions (Kandel, 1985). While this might hold for very close friends or 'best friends', the data presented here suggest that attitudes and values towards substance use do not necessarily promote or preclude friendships (or at least inclusion in certain social networks). Instead, young people may socialise with individuals who exhibit a range of behaviours, values and attitudes. Peers clearly had played a role in influencing drug-related decisions and opportunities among the young people interviewed for this study. However, rather than being passive in social situations, and therefore subject to pressure, this group of young people described a process in which they weighed up the costs and benefits and formulated their own attitudes, values and behaviours. The interviewees recognised the influence that their friends had over them but, in acknowledging this, reported that they made their own decisions.

As mentioned in the introduction to this chapter, there is some suggestion that all young drug users have fairly rigid rules governing their drug-using behaviour and certain boundaries which they will not cross (Glasner & Loughlin, 1987). A section of the qualitative interview explored some of the boundaries set by peer groups regarding drug and alcohol use. Even people with considerable substance use experience, which might seem unacceptable to many of the sample group, had their own boundaries indicating what they would or would not do. For example, a 21-year-old male, whose friends were fairly regular heavy drug users (using cannabis, ecstasy, amphetamines,

LSD, hallucinogenic mushrooms[1], ketamine[2], diazepam[3] and a few using heroin), described how he perceived the boundaries held by his peer group.

> **I:** *Do your friends use crack?*
>
> **R:** *No, I don't think anybody would ... as far as me and 99.9% of my friends are concerned, you get so far and then there's a line and then across that line is heroin and crack and stuff - the things that you just don't do because they are too strong for people to handle and shouldn't be touched. (Male aged 21).*

Another female interviewee had similar views:

> **I:** *Are there any drugs you and your friends would never use?*
>
> **R:** *Heroin, and I don't think any of my friends would ever inject. (Female aged 20).*

In this next excerpt, a 20-year-old female explains how her peer group had definitely affected where her drug-related boundaries lay.

> *It seems OK to take 'E's and speed and things but wrong to take heroin - I think that's from my social circle. (Female aged 20).*

Several of those in the sample who mainly used alcohol and cannabis and had had very little experience of other drug use reported that their peers grouped drugs such as ecstasy alongside heroin and crack:

> **I:** *Are there any drugs that you think your friends would never use or try?*
> **R:** *Most of my friends probably wouldn't use heroin and a lot of them wouldn't try ecstasy.*
> **I:** *Why?*
> **R:** *Because we've heard about the people dying. It's too dangerous, they don't want to risk it. They're put off by the idea of injecting drugs as well. (Female aged 16).*

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[1] *Also referred to as "magic mushrooms". In the UK, the Liberty Cap is the most commonly used hallucinogenic mushroom. It contains psilocybin which has a similar (but milder) effect to LSD (ISDD, 1996).*
[2] *Ketamine is an anaesthetic with hallucinogenic and analgesic properties. It is a prescription-only medication.*
[3] *Commonly known by its trade name – Valium. This drug is a benzodiazepine, which is a prescription-only medication and controlled under Class C of the Misuse of Drugs Act.*

Overall, the data supported the idea that the peer group shared common boundaries concerning drug use, although behaviour within these boundaries often differed considerably between individuals within the group. In contrast to peer cluster theory, it did not seem that peer influence was responsible for mediating the influence of all other factors.

3.4.3 Individual factors

The data presented so far in this chapter suggest that the availability of a drug and the extent to which peers support its use influence the individual's patterns of substance use. However, differences still exist in decisions and patterns of use between peers who share similar demographics and environment (i.e. those who inhabit the same peer group and are therefore subject to the same peer influences and who have equal access to drugs). This section discusses two sets of individual factors that were identified as influencing patterns of use: expectancies and functions for use.

3.4.3.1 Expectancies

The beliefs that individuals held concerning the effects of a drug appeared to influence the choices they made regarding their substance use. As discussed in Chapter One, the term 'expectancies' has been used in the literature to denote such beliefs (e.g. Brown et al., 1980; Goldman et al., 1987; Carey, 1995). Users commonly described how their expectancies about the effects of a drug helped them to decide whether or not to use it and, if so, under what circumstances. Several different aspects of expectancies were identified. Most initial expectancies held before initiation into use had resulted from observing friends using the drugs or from hearing their stories about use. One male respondent explained how watching his friends using ecstasy had influenced him:

> *Well, I did know what the effects were [from ecstasy] because a lot of my friends at the time were already into the rave scene and, well, I was into the rave scene, but I was just doing speed, just to keep me going and by the time I actually got round to using ecstasy, I'd already seen what ecstasy was doing - like what it did to other people ... so I had a pretty good idea what to expect. (Male aged 21).*

His friend described similar experiences:

> *I don't jump straight into stuff like pills [ecstasy.] I heard about pills and a lot of friends I knew were taking them but it was a good couple of years before I did them ... I talked to my mates about what it does and I've heard from other people who have took it. (Male aged 20).*

In the following excerpt, another interviewee explained that it was important that he felt confident that he knew what to expect from a drug before using it for the first time:

> *I wouldn't try doing crack or anything like that because I don't know the effects..... If I did go into something like that, I'd have to watch other people when they were using it and see how they react ... I wouldn't just jump in feet first, I'd want to know what to expect. (Male aged 21).*

For other participants, seeing friends while under the influence of drugs had been a powerful deterrent to use. For example, in the following quote a 21-year-old female explains why she had never tried LSD:

> *I've seen friends just sit in a corner and look all weird for ages and start chatting to themselves ... You wonder why I don't want to take it? I've seen the state of my friends! (Female aged 21).*

These observations had influenced her expectancies about the effects of LSD and led her to the conclusion that she would not like to experience this particular drug:

> *It scares me 'coz I've heard a lot of stories about it and bad times they've had and I just couldn't imagine controlling something like that ... I mean you can't stop it once it starts and it lasts a long time, like eight to twelve hours. (Female aged 21).*

A male respondent had similarly been discouraged from using ecstasy:

> *I've seen my mates out on it [ecstasy], I saw my girlfriend out on it, and they just didn't even know who I was ... and I like having a rough idea of where I am, who I'm with, what I'm doing.. I just didn't like the look of what the ecstasy was doing. (Male aged 20).*

However, it was not just through watching and hearing about their friends' experiences that negative expectancies leading to abstinence were formed. For some respondents,

hearsay (i.e. stories about people unknown to them, or 'urban myths') or stories in the media had played an important role. As one young female commented:

> *You hear stories of how people think they can fly and jump off buildings and how they see bugs crawling and I wouldn't want to risk it [using LSD]. (Female aged 16).*

In particular, press and television news stories were frequently mentioned in association with ecstasy use. The following excerpt from an interview with a 17-year-old male was typical:

> *I'm scared of what the consequences might be [from trying ecstasy, LSD or amphetamines], ... like on the news you see that this guy he took ecstasy for his first time and he died, and I think that if I do that then that could happen to me. So it's not worth taking the chance. (Male age 17)*

Another young male held similar views:

> *A couple of people I know have done E's, but I think people are scared to do 'em 'coz you see people in the newspapers and that, people dying ... so people are scared of it. (Male age 16)*

Several people reported that they had been very influenced by news stories of ecstasy-related deaths. In some cases, this had led them to review their expectancies relating to the drug and consequently conclude that the possible benefits of using were not worth the attendant risks. Others had either dismissed the accounts completely or offered explanations that cast the victims as incompetent drug users. Several described how they had constructed certain rules for themselves (such as limiting their use, or drinking sufficient liquids) which they thought would protect them from harms when using ecstasy. One example of this was given by a 20-year-old male:

> *If you use ecstasy, you find out that it really isn't as dangerous as they say in the media and the dangers can be reduced by watching your temperature, drinking (not drinking too much - the right amount) and by taking salt and isotonic drinks and avoiding hot and cramped conditions like you get in clubs. (Male age 20)*

This process had allowed him to retain his positive ecstasy-related expectancies, but he had modified them to take other factors into account such as keeping cool and hydrated. Expectancy modification was common: many respondents described how they had changed their perceptions about certain drug types subsequent to personal experiences. Modifications often incorporated a personal appraisal of the effects. For example, one male respondent described his first LSD experience:

> *The first time I took acid I was in a pub. I wasn't sure what to expect. I thought it would make me see funny things, but wasn't really sure... but the whole thing, I thought it was brilliant! I loved it! I wanted more the next day. (Male aged 21).*

Overall, among this group of young people, expectancies were commonly updated and modified as more personal experience was gained. As an individual gathered more experience or information about a drug, their expectancies became more sophisticated. For example, an initial expectation about the effects from cannabis could be "cannabis makes me giggly"; as more experience is gathered from watching people, listening to stories or from increased personal use, this expectancy might be modified to take dosage into account, thus becoming "cannabis makes me giggly if I smoke a little and very sleepy if I smoke a lot". With the addition of another substance, such as alcohol, a further modification could be: "cannabis makes me giggly if I smoke a little and very sleepy if I smoke a lot. But if I smoke cannabis after I've been drinking alcohol, then I get sick."

Another variable that seemed to be gradually incorporated into the drug-related expectancies held by some individuals, as they became more experienced drug users, was their current state. This could be on a physical level (such as feeling tired) or a psychological level (such as feeling depressed). An individual's current state seemed to be a critical influence on the decision whether or not to use a substance at that particular time. For example, one experienced user of LSD explained how he expected a user's current psychological state to influence the effects experienced from this drug:

> *If you're dwelling on something that's depressing you, all the emotions that you've bottled up do come out on LSD it can be pretty heavy. (Male aged 20).*

Another respondent explained how the drug and alcohol-related choices that he made were influenced by his current mood. He appeared to have constructed general expectancies concerning the long-term risks associated with taking any of a range of different drugs to relieve negative mood:

> **R:** *I never do drugs to cheer myself up. I will smoke cannabis to calm myself down, but if I'm feeling depressed then I will never do ecstasy, speed or LSD or anything in order to cheer myself up. I'll only ever do it if I'm already happy.*
>
> **I:** *Why won't you do it to cheer yourself up?*
>
> **R:** *Because that's what I see as then becoming psychologically dependent on the drug because if you do it once, obviously next time it happens then you'll just go "oh - I'll do it again," and then you'll do it again and again and again and that's how addiction would overtake me, personally (Male aged 21).*

In addition to their current psychological state, some participants in the study also mentioned that their physical state influenced their drug and alcohol-related decisions. For example, they might consider how tired they were, as the next quote illustrates:

> *If I'm tired or run down then I've found I'm more likely to feel crap with speed so I tend to avoid it and stick to beer. (Female aged 20).*

Alternatively, they might consider whether or not they were already feeling the effects from another substance as a 20-year-old male respondent explained:

> *We very rarely take ecstasy when we go out drinking ... If you take ecstasy when you are really pissed it can reduce the effects of the ecstasy. (Male aged 20).*

One of the older female cocaine users explained why she tended to take into account how much she had eaten before using:

> *From past experience, I know that for me using charlie [cocaine] on an empty stomach is bad news – I just get really anxious and jittery... I can't seem to get into it. (Female aged 21).*

Describing negative effects in association with substance use (such as feeling anxious as mentioned in the last quote) was very common in the interviews. Although inextricably linked to expectancies, these experiences appeared to have such significant impact on patterns of substance use as to merit separate consideration.

3.4.3.2 Negative effects

Prior negative experiences with a substance were identified as having an impact on consumption patterns and associated choices in the sample. Overall, three types of response to negative effects were evident in the data: i) the negative effects were accepted as a consequence worth enduring for the positives experiences obtained from use ('acceptance'), ii) drug-related behaviours were modified in some way to reduce the likelihood of a repeat experience ('modification'), or iii) a user decided to abstain from using the drug altogether in the future ('abstinence'). Which of these options was selected by an individual appeared to depend on an appraisal of the relative costs and benefits associated with use of the drug. This process was closely linked to the expectancies held concerning the outcomes from the behaviour (as discussed in the previous section) as well as functions for use.

i) Acceptance

In general, most users appeared to expect and accept a certain amount of negative effects after substance use, as the following extracts illustrate:

> *[talking about amphetamines]*
> *I get irritable ... its not unbearable, I mean I still go out and take it or whatever, but I'll be irritable, I'll get in arguments, I wouldn't eat, but I'd be hungry, just worn out and I dunno, just on a bad down, but its not so bad enough that it makes me stop using it. (Male aged 16).*

Similar sentiments were expressed in relation to alcohol use:

> *I get quite bad hangovers sometimes much more than I used to, but I guess that's just part and parcel of drinking loads! (Female aged 19).*

For both these individuals, the negative effects did not outweigh the positive side of using these drugs and so consumption continued. Similar observations have been noted elsewhere (e.g. Parker et al., 1998).

ii) Modification

A second response to negative effects was to modify consumption behaviours. Many respondents described adjusting their behaviour to avoid or reduce future negative effects. This process also resulted in a modification of their expectancies to assimilate the adjustments. For example, one 19 year old had disliked being unable to sleep after taking a gram of amphetamine sulphate during one evening. Instead of modifying her amphetamine-related expectancies to include insomnia, she had worked out how to avoid this unwanted effect and modified her behaviour accordingly:

> *I wouldn't take a whole gram again - at the most I would take a half ... I just don't like that whole feeling of not being able to sleep. (Female aged 19).*

Behavioural modification was particularly common in relation to alcohol use. In contrast to the other drugs discussed, the alcohol-related expectancies often took physical and psychological factors into account as well as the amount consumed. For example, some respondents reported that they considered factors such as how much they had eaten and how strongly they were experiencing the effects from alcoholic drinks already consumed or other drugs, when deciding on their limits. In general, most interviewees described positive expectancies concerning alcohol use up to a certain limit, after which they expected to experience negative effects (such as vomiting).

> **R:** *Last year, when I didn't know where to stop and I just went over the top a lot, I got ill quite a lot. Now I know where my limit is. I don't drink as much and I don't get ill.*
>
> **I:** *How can you tell where your limit is?*
>
> **R:** *I usually think, "well I've had that much, I haven't eaten much, if I have much more I'm gonna be ill". Depends on what you've eaten during the day as well, if you've eaten a lot you can usually take more. (Female aged 16).*

Another respondent commented:

I usually drink less when I'm smoking it [cannabis] 'coz it can make you ill as well. If you mix the two it makes you feel a bit funny. (Female aged 16).

Behavioural modifications relating to alcohol and cannabis use tended to be very similar to those described above. Users restricted subsequent consumption to within certain limits. Modifications described in relation to other drugs often took other factors into account, such as drinking water and keeping cool, when using ecstasy or remembering to eat before using cocaine.

iii) Abstinence

In some cases, the experience of negative effects resulted in an individual deciding to abstain from use altogether in the future. Formerly positive expectancies concerning the drug that had contributed to use occurring were modified. If they had disliked an experience with a drug, then a similar experience on the next occasion of use was often expected and respondents were therefore more likely to decide against subsequent use. The following quote from an interview with a 21-year-old male who had used LSD on more than 20 separate occasions illustrates this point:

I used to think it was great, but I'd never take acid [LSD] again or any strong hallucinogen now 'coz it just fucks my head up... makes me paranoid, I lose myself completely in it - it completely takes control over me. (Male aged 21).

Alternatively, there was evidence that some participants had stopped using a drug as a result of finding another which fulfilled similar purposes for them but caused fewer negative effects. This next quote is taken from an interview with a 20-year-old male who had started to use cocaine in preference to amphetamines as a result of experiencing unpleasant after effects:

I don't like speed... the experience of the come down in the morning and also when you're on speed sometimes you just notice that you're getting nasty shakes and you get stomach ache and cramps and things and you just think well if this is a good drug it shouldn't be doing nasty stuff to you. I've found charlie [cocaine] is much gentler. (Male aged 20).

Overall, the most commonly reported negative effects described by the sample were vomiting or feeling sick, as one female respondent explained:

> *I don't like throwing up... but I don't do that at all really anymore 'coz I know how much I can drink and not get ill off it. I also try to avoid smoking [cannabis] if I've drunk loads, 'coz that can make you ill too. (Female aged 16).*

Her friend described similar experiences after using strong cannabis:

> *When we did skunk [a strong type of cannabis] I got like hallucinations and stuff like that, just feeling really horrible... felt really sick and ... its worse than drink 'coz you can't really get out of it ... When you're drunk, if you're sick then you can sober up more easily, but if you're on cannabis and you're feeling really really horrible and you're spinning and everything, you can't really come out of it very easily and you can't sleep. You're just there wishing it would stop. (Female aged 16).*

Feeling anxious or 'paranoid' and wanting the effects to stop (usually as a result of having consumed a larger dose than intended) were also common.

> *Being paranoid, that's the worst thing ... I get paranoia about police a lot when we're walking down the street, like coming home at 3 or 4 o'clock in the morning from a friend's house, we're so paranoid... like put it [cannabis] in our shoe, put it in our boxers and that and we're always looking behind our backs. (Male aged 16).*

Anxiety was mainly reported in association with LSD, ecstasy and cannabis, whereas the other negative effects appeared to be experienced in association with all substances discussed. Some respondents also described situations where they had regretted using a drug. The following excerpt in which an 18-year-old female comments on her experience with LSD illustrates this:

> *I just sat there thinking "this is a nightmare, I hate it, why on earth did I take it?". The first couple of times were a laugh, but last time, I dunno, I just wanted it all to just stop, it was horrible. (Female aged 18).*

There were also reports of people having accidents or doing things that they later felt were unwise or risky (such as driving or sex) when intoxicated. One female respondent talked about feeling out of control when she'd been drinking alcohol:

> *With alcohol I don't know what I'm doing and so I don't like it ... I find it really scary - I'd rather be off it on pills because I know what I'm doing and I've got some control rather than on alcohol 'coz after a few drinks ... I know that on drugs I would never do anything with anybody else in that sense [sexually], but with alcohol, I don't know, so that's one reason why I don't drink when I'm going out. (Female aged 20).*

Others described accidents that had occurred when intoxicated on alcohol or cannabis. For example:

> *If you get really drunk you don't know what you're doing. Some of my friends have fallen over and hurt themselves and thrown up really badly. (Female aged 16).*

In summary, the experience of negative effects associated with substance use appeared to have an important influence on both substance-related expectancies and behaviours. However, a further major influence discussed in the next section is the specific function or purpose which use fulfilled for respondents.

3.4.3.3 Functions

A factor even more proximal to drug behaviour than expectancies that was identified in the data was the specific 'functions' that substance use fulfilled for respondents. As discussed in Chapter One, the term 'function' denotes the purpose or role of an object or thing (Collins English Dictionary, 2000). The function of a drug could be explained as the perceived benefit or purpose that its use serves the consumer. In contrast to expectancies that can be held without use of a drug occurring, functions are much more closely related to behaviour. For example, an individual might believe that using amphetamines helps people to lose weight or to stay awake all night (i.e. their expectancies), but if they had no desire for these functions to be fulfilled its unlikely that they would choose to use this drug. It therefore seems possible that functions can help to further explain differences in patterns of substance use between individuals from

similar environments, with similar peer influences and personal expectancies regarding substance use.

Analyses of the interview transcripts revealed that drug use fulfilled a wide range of functions for the interviewees. While there was evidence that respondents often used specific drugs for several different purposes (such as using amphetamines to stay awake when studying or to help lose weight), there was also data to suggest general differences in the types of functions for use between different substance types. As might be expected, these differences were commonly linked to the pharmacological effects of the drug. For example, cannabis and alcohol were frequently used to help relax or to help sleep while the stimulants were more widely used to help increase energy levels for dancing or to help stay awake. The different specific functions for drug use that were identified fell into five main categories:

i) Social purposes
ii) Changing mood
iii) Specific physical effects
iv) Facilitating activity
v) Managing other drug effects

In this section, the findings are presented and discussed for each of the above domains in turn, rather than drug by drug. It was not uncommon for use of a drug to appear to fulfil several different purposes simultaneously and so many excerpts mention several functions at once that are often relevant to different domain areas.

<u>Social Purposes</u>

The majority of the substance use was associated with socialising and a range of socially motivated functions was reported. A common function associated with stimulants was to increase energy in order to 'keep going' when out with friends or to dance for prolonged periods of time at parties and nightclubs. Several respondents contrasted the effects of drugs such as ecstasy or amphetamines with alcohol and cannabis saying that they tended to just fall asleep if they used the latter two, which was undesirable when out clubbing. The following quotes were typical of those who only used amphetamines when going out to nightclubs:

[amphetamine use] It's just for clubbing... it keeps me awake, it keeps me going all night, dancing all night - that's why I use it really and it makes me feel much more happier and relaxed and gets rid of all my inhibitions and I go for it! (Female aged 20).

Equally,

I do it [take amphetamines] 'coz, you can dance and you can like stay up for a lot more longer than would if you had just been drinking. (Female aged 18).

For ecstasy, increased enjoyment seemed to be an important determinant of use at parties or nightclubs. Respondents talked about ecstasy helping them to enjoy the music more, the atmosphere or the company of their friends. Although ecstasy was commonly regarded as a 'social' drug, use was not necessarily associated with prolonged activity such as dancing. Users were often content to sit quietly and enjoy the experience together:

'E's [ecstasy tablets] are just a social thing - with 'E's the music sounds so good and you are so confident and so open ...with 'E's you can sit there quietly and you don't have to talk, you can just sit there and appreciate the music and the company. (Female aged 21).

The 21-year-old respondent quoted above mentioned confidence in relation to her ecstasy use. Using a drug to increase confidence in social situations was a common function for the use of many of the substances discussed in the interviews. This point is further elaborated in the next excerpt from an interview with a 21-year-old male student. He explains how smoking cannabis helped him to avoid feeling uncomfortable in social situations.

The more you're stoned, the more relaxed you feel ... I think it's more of a social kind of drug. If everyone's nicely stoned then you're not pressured to talk if you don't want to - you can always sit there and listen. I find when I'm straight [not intoxicated] anyway, I can sit in a room with somebody and if I've got nothing to say then I'd feel uncomfortable ... but if I was stoned or slightly drunk, that uncomfortable silence wouldn't be an uncomfortable silence anymore. (Male aged 21).

There was evidence to suggest that many of the drugs used by the respondents were consumed for similar purposes: to feel more confident or comfortable in social situations or to decrease inhibitions.

I: *Why do you use ecstasy?*

R: *Confidence boost - feel so much less inhibited by everybody else, its just that carefree feeling of not really - doesn't really matter what people say or do (Female aged 20).*

Another respondent described using ecstasy to help him to feel more confident when talking to people he did not know.

I went through a phase when all my friends from home - they went up to London to college or off to university ... I went through a phase of doing E's just to pub hop .... I'd go round loads of pubs and drink and take an E and just have the bottle [confidence] to chat to people I didn't know. (Male aged 22).

For some, alcohol fulfilled similar functions: lowering inhibitions and increasing confidence as the following quote illustrates:

It [alcohol] helps you feel ... like more up for doing things like dancing in clubs, you don't really give a damn. You just do what you want. (Female aged 16).

A male respondent commented:

I feel kind of a bit stupid or self-conscious trying to dance if I'm not a bit pissed or whatever ... if I've had some beers then I feel... not like I'm a great dancer or anything but I don't feel so awkward. Mind you, I probably look just as stupid, I just don't care so much I spose. (Male aged 18).

Another female respondent explained why she liked the increase in confidence that she obtained from drinking alcohol:

I like the Dutch courage bit - you can say a little bit more than what you know you should do and be a bit more daring and a bit more lairy. (Female aged 19).

Feeling more confident and less inhibited seemed to be particularly important for respondents when they were trying to establish sexual relationships. For some,

particularly males, substance use helped increase their confidence for making advances and helped them to deal with being 'knocked back', as the following excerpt illustrates:

> *I can only really chat to girls I don't know if I'm a bit pissed. Sort of confidence thing really - it helps me to feel braver about asking them out too. (Male aged 17).*

There were also reports that certain drugs enhanced sexual experiences as one 19-year-old female explained:

> **R:** *Charlie (cocaine) is great for making sex more, I dunno, more mind-blowing!*
>
> **I:** *Do you use other drugs for sex ever?*
>
> **R:** *My boyfriend and I tried to do it after a trip [LSD] once, but it was a disaster – just couldn't get it together! No, I think charlie's best for that ... (Female aged 19).*

This latter function for substance use was only mentioned explicitly in association with stimulant use. However, as interviewees were not asked specifically to comment on this issue, the possibility that other drugs were used for this purpose remains.

<u>Using to change mood</u>

The second major category of substance-use function identified was 'using to change mood'. In particular, using drugs to help reduce various forms of negative affect was widely reported. For example, drugs were used to help relieve feelings of depression, to help to stop worrying about problems and to deal with boredom. The latter function tended to be mentioned in association with work:

> *I was working at the [large department store] as a Saturday job while I was at college ... and I spent about £15 a day on speed [amphetamines] to keep me going - to make it more enjoyable because it bored the hell out of me. (Male aged 21).*

or study:

> **I:** *You mentioned that you often smoke cannabis to make something you're doing less boring – what sort of activities do you do this for?*

R: *Coming to college, and when I'm at work I smoke. I work weekends, the work I do is loading and so if you got a buzz then you just feel more happy about doing the work - it makes you feel less tired. Unless I smoke, it's boring. (Male aged 17).*

The following excerpts were taken from an interview with an 18-year-old woman who had been sleeping rough for the last nine months. She was a daily cannabis user who used benzodiazepines on occasions to help her to sleep and ecstasy when going to a nightclub. During the day, her primary motivation for using drugs was to help her to forget her problems and to feel more positive about life. Recently, she had begun to inject methadone ampoules, as she had discovered that this drug was better at helping her to fulfil this need than cannabis. She explains the reasoning behind this choice below:

An amp [ampoule of methadone] makes you gouch and you forget about everything, because you are so worried about when you are going to be sick next that you just want to be on your own and you just forget about everything ... I mean cannabis can help because it makes you laugh and so you can sit there and think things are funny, but you know amps block everything out whereas on cannabis you can still think about it, (Female aged 18).

Others described using cannabis to forget about problems and to feel more relaxed:

I prefer to smoke [cannabis] than I would to drink, because of the relaxing feeling - if there is anything niggling at me it tends to be locked away when I'm stoned. I tend to feel more relaxed and at home with myself when I'm stoned and then more confident 'coz if I'm relaxed I'm more confident and I can babble on for hours and hours. (Male aged 21).

A 16-year-old respondent described similar motives for cannabis use:

It [cannabis] helps you forget things ... you forget that maybe you've got to get up in the morning and you've got exams the next day. You forget about all your worries and stuff just for a little while. (Female aged 16).

This use of a drug for 'time out' from everyday life was common across all drugs discussed in the interviews. However, it tended to be cannabis (and alcohol to a lesser

extent) that appeared to be most commonly associated with relaxation and 'unwinding', as the following quote illustrates:

> *You can just come home and have a smoke and it just relaxes you ... it just calms you and if you're in a really stressful situation - everything seems ok once you've had a joint. (Female aged 18).*

A 19-year-old male expressed similar views:

> *I just find it [smoking cannabis] helps me chill out after a hectic day. I get home, skin up and as soon as I have that first toke its like ahhhhhhh and everything drains away ... or sometimes I just go down the pub after work for a couple of beers to chill out, especially in the summer. (Male aged 19).*

Another common purpose for drug use mentioned in the interviews was to feel happier or more positive about life. This motive for substance use was mentioned in association with ecstasy use that was often used to help the user to feel elated or high (as its 'street' name suggests).

> *I do it (use ecstasy) when I'm out clubbing – its just for the whole euphoric experience you feel - you feel like you want to be having fun ... and doing drugs like ecstasy gives me a lot more energy as well. (Male aged 21).*

Similar reasons were described for alcohol use. For example, in the next excerpt a female respondent described why she liked drinking alcohol when she was out with friends at the weekends:

> *I get really happy and really nice to everyone. I don't usually get angry with anyone. I think I like it because I'm just happier, a lot happier - hyper. I'm sociable anyway but it helps to give me more confidence. (Female aged 16).*

In this latter quote the respondent again mentions confidence in association with alcohol use. This was discussed in earlier in the section.

Using for physical effects

The third category of functions related to use for specific physical effects. Some of these are likely to have psychological components but for brevity have been categorised here as 'physical'. In particular, enhancing energy levels was particularly common for amphetamine use. This drug was often used at nightclubs and helped to facilitate sustained dancing across the evening. This next quote was typical of the amphetamine users interviewed:

> *I use speed just for clubbing...I like it 'coz it keeps me awake, keeps me going all night, dancing all night, it gets me into the mood.. (Female aged 20).*

Another physical use for amphetamines was as an appetite suppressant. A few female respondents mentioned using amphetamines to help them to lose weight as the following quote illustrates:

> *Sometimes when I want to lose a bit of weight then I'll have some [amphetamines] and fast for a day as I'm going on my diet, 'coz it stops me wanting to eat. (Female aged 20).*

This particular female went on to describe dieting as the primary motivation for using the drug, over and above any psychological effects that she felt from it.

While obviously not associated with the stimulant drugs, there was some indication that cannabis and alcohol were sometimes used to aid sleep. One young man described how he used cannabis to relieve his chronic insomnia:

> *I suffered from insomnia extremely badly when I was younger and nothing that the doctors told me or gave me would cure the problem - sleeping pills just knock you out and then you feel horrible the next day, whereas cannabis really does have a lot of medical uses, one of which is for insomnia. (Male aged 20).*

Although the above case was extreme, it was particularly common for cannabis to be used in combination with other drugs (particularly the 'dance drugs') to help them to 'come down' and to aid sleep at the end of a night out. Alcohol served a similar function for some interviewees:

I've had problems sleeping after using speed, but I've found if I drink a load when it begins to wear off so I'm a bit drunk before I go to bed it helps me to drop off. I've also used sleeping pills a couple of times when I've been desperate. (Female aged 19).

This use of drugs in combination with other substances is further discussed later in this section.

<u>Using to facilitate activity</u>

There was evidence to suggest that some drugs were used to help enhance or facilitate certain activities. For example, several interviewees described using cannabis when they were working to help them to concentrate or to make a task more enjoyable:

When I'm on cannabis, I feel I make more conscious decisions because I can concentrate more ... I usually have it before I go to work (waitressing) and I enjoy work so much more if I am stoned. (Female aged 19).

There were reports from other respondents of using cannabis to help them to concentrate on specific tasks, such as painting, or with the more generalised purpose of focusing thoughts as the following quote from a 20-year-old student illustrates:

I started smoking it [cannabis] mainly to slow my mind down, my mind would go off at such a horrendous pace that I couldn't actually slow it down enough to use it objectively. I found that under the influence of cannabis it slowed down and I could order my thoughts ... and I liked the way it made me think. (Male aged 20).

Similarly, amphetamines were often used in association with work or study. The functions for use in such circumstances tended to relate to relief from tiredness or to increase motivation. The following quotes illustrate these points:

If anyone asks you to do anything it's not really a problem ... it's usually when I'm working [waitressing] that I take it [amphetamines]. (Female aged 19).

When I was doing my A levels, I went through a stage of using [amphetamines] everyday and it's just so good because you're on top of everything ... everything is so organised ... if someone comes up to you and says "Right, I want a 2,500 word essay for tomorrow" and you're like "yeah! Whatever!" and that's why I used it because I'm not an organised person

anyway and speed will definitely keep me organised. (Female aged 18).

There were no similar accounts of using amphetamines to facilitate work or study in any of the interviews with male respondents. However, a few of the younger males described using this drug to enhance enjoyment when listening to (or making) music or even participating in other activities such as sports. As one 16-year-old explained:

> *We use it [amphetamines] for listening to music and sometimes if you're in a park, playing some footy or something it's normally quite good (Male aged 16).*

Another commented:

> *I use it sometimes for a mix ... when we got a set of decks and speakers and an amp and that and everyones got new tunes and that sort of thing ... because when I'm MC-ing I've gotta sorta chat ... 'coz it makes my tongue quicker and that's all part of it. (Male aged 16).*

It seems that the extent to which drugs are used to facilitate activities might differ between the two genders. However, it was not possible to draw any firm conclusions regarding this issue on the basis of the current dataset.

<u>Using to help manage other drug effects</u>

The final category of functions for drug use identified in the study related to using more than one drug at the same time or 'concurrent drug use'. Similar patterns of concurrent drug use have been reported in other studies of young drug users (e.g. Boys et al., 1997). The present study did not attempt to document patterns of concurrent use in detail. Instead factors that influenced decisions to use a particular substance while already experiencing the effects of another were examined. Simultaneous drug use appeared to serve three purposes. Firstly, a drug was sometimes used to help manage the effects from another drug. Use of alcohol or cannabis for this purpose was particularly popular, particularly in combination with one of the 'dance drugs'. The following excerpts from interviews with two 20-year-old males illustrate this point:

> *We generally drink before we take ecstasy as it [alcohol] does help to relax you and stops you getting all edgy. (Male aged 20).*

His friend explained:

> *We'll always smoke dope [cannabis] before we take ecstasy, but small quantities because it puts you in that mood and you're less likely to come up too fast [from the ecstasy tablet] and freak yourself out. (Male aged 20).*

There was less evidence that other substances were used to help manage drug effects, although some described using amphetamines to help to reduce feelings of drunkenness, thus enabling the user to continue drinking alcohol throughout an evening.

> *If I can't get hold of any ecstasy, I'll do speed and drink beer, 'coz with speed [amphetamines], when I do use speed at clubs, I find that I can drink a hell of a lot more. (Male aged 21).*

Secondly, two or more drugs were also sometimes used together to help enhance the desired effects. As one female respondent explained:

> *A line of coke helps to bring you back up when you're on a pill [ecstasy tablet] – the two together are wicked. (Female aged 21).*

Another interviewee described using alcohol and cannabis simultaneously for similar purposes:

> *I went through a phase of drinking and smoking as well just because I'd get more out of smoking by drinking a load ... I'd purposively not smoke for about half an hour while I downed loads of alcohol and then smoke because it would make the high better, the initial rush off the bong. (Male aged 22).*

Nabben & Korf (2000) noted similar findings from their recent study of combined substance use in young Dutch stimulant users. They also found that cannabis and alcohol were often used to 'calm down' after clubbing. As discussed earlier in this section, a common function for cannabis use in the current study was to help relaxation. This was particularly common in the context of helping to ease the after effects or 'come down' from one of the 'dance drugs', as a 21-year-old male explained:

I use cannabis just basically to slow me down. I mean, I usually use cannabis as I'm coming down off my drug [ecstasy or cocaine or LSD]. I mean instead of coming just whack, bang, bollocks, straight down, cannabis usually kind of floats me down. (Male aged 21).

Another male respondent had similar views:

I prefer to get hold of some cannabis before we take LSD definitely ... basically we're taking it for medicinal purposes then - to make you feel better from the situation you've gone and got yourself into, to get rid of the nastiness on the come-down [the after effects]. (Male aged 20).

There were also reports of using other drugs to fulfil this type of function, such as alcohol or benzodiazepines, although this was less common.

In summary, drug use appeared to fulfil a wide range of functions for respondents both on personal and social levels. Five categories of functions were identified in the present study. It should be noted that there was a certain amount of overlap between these categories and they should not be assumed to be independent from one another but rather provide a convenient framework for analysis. The range of different functions within these domains is summarised in table 3.3.

There were broad similarities between the drug-use functions identified in the data and the 'reasons' and 'motivations' for substance use cited in the research literature. In particular, substance use to reduce negative affect or to be sociable has been widely described elsewhere (e.g. Farber et al., 1980; Ratliff & Burkhart, 1984; Bradizza et al., 1997; Carey & Correia, 1997; Williams & Clark, 1998). For example, Segal and associates (1980) categorised reasons as related to using a substance to 'increase positive affect' or using 'to decrease negative affect'. Nevertheless, despite these similarities, the data supported the identification of specific functions (or purposes) for substance use rather than more simple reasons or motivations.

Table 3.3 Functions reported for use of different substances

Domain	*Function*
Social purposes	- To enjoy the company of friends - To increase confidence/decrease inhibitions - To dance - To keep going - To facilitate forming sexual relationships
Changing mood	- To relieve depressive thoughts - To get away from problems - To relax - To feel elated or 'high'
Physical effects	- To enhance sex - To stay awake/increase energy - To suppress appetite/lose weight - To help to sleep
Facilitate activity	- To help to concentrate - Stay awake/feel less tired when working - To enhance listening to music - Increase enjoyment when playing sport
Manage other drug effects	- To enhance the effects of other substances - To manage side effects from other substances - To help ease the after effects of other substances

3.5 Chapter overview

This chapter has presented the findings from 40 qualitative interviews conducted with young substance users aged between 16 and 22 years. The primary aim of the study was to examine patterns of polydrug use from the perspective of the individual and to identify factors that they reported influenced their substance use.

A range of demographic, social environment and individual level influences on substance use were identified. These included gender, drug availability, peer influence, expectancies, negative effects and functions for substance use. However, it is important to note that many of these factors were inter-related rather than independent influences on substance use, and the complexity of these relationships should not be underestimated.

There was evidence that patterns of substance use differed to a certain extent by gender. Among the younger respondents in the sample, males tended to smoke more cannabis (and were therefore the major suppliers of this drug to the peer group) while females preferred to drink alcohol. There was some suggestion that this difference might have arisen from gender differences in the side effects experienced from these two drugs. However, differences in the types of drug-related effects preferred by males and females were also noted. Females seemed to favour more physical and less hallucinogenic effects from drugs such as amphetamines, while males enjoyed LSD to a greater extent. This could indicate a general difference in the way that males and females use drugs and the motivations that underpin use.

Although availability was highlighted in the interviews as a significant influence on patterns of use, the relationship was complex. There was evidence that a lack of availability sometimes resulted in an alternative drug being consumed rather than abstinence. Availability is likely to vary considerably across the different target substances. In particular, the list of target drugs included alcohol, which is legally available in the UK under certain restrictions. Any general patterns relating to all target drugs therefore seemed unlikely as the dynamics of how availability relates to patterns of alcohol consumption are likely to differ from those relating to the other illicit drugs. Furthermore, the inclusion of 16 year olds and 17 year olds in the study population (i.e. those under the legal drinking age), added further complexity, as the physical

appearance of these individuals (i.e. how old they looked) could have had a major impact on the ease of availability of this substance, particularly for boys.

The important role that peer substance use played in influencing the drug-related decisions made by the interviewees is in accordance with much of the literature in this area. Although it was common to have friends whose substance use was similar to their own, many respondents also described friends who had quite different use profiles. Overall, the interviewees did not perceive their peers as exerting undue pressure on them to use drugs, but as providing the opportunity to use and a supportive environment. In particular, the substance use of partners and 'best friends' seemed to be particularly important regarding drugs other than cannabis and alcohol. Although it was common to describe the peer group as having similar attitudes and boundaries concerning what was and was not acceptable drug-using behaviours, interviewees clearly saw themselves as active decision makers regarding their own consumption. There was evidence that many engaged in a complex process in which the costs and benefits from use were weighed up when making these decisions and that internal individual level factors played a central role in this. Overall, the data provided only partial support for Oetting and Beauvais's 'peer cluster theory' (Oetting & Beauvais, 1986, 1987), as peer influence did not appear to mediate the influence of all other factors on drug-using behaviour. However, it important to acknowledge the possibility that 'self-serving bias' may have affected the data. Self-serving bias refers to the tendency for individuals to take credit for behaviours they regard as successful or positive and to attribute negative behaviours to external circumstances (Brown, 1986). It is possible that admitting to being influenced by peers was generally socially undesirable and so unlikely to be recognised by respondents in the context of the interview.

Three 'individual-level' influences were identified in the data: expectancies, negative effects and functions. As widely noted in the literature, expectancies about substance use were clearly linked to patterns of behaviour. Expectancies appeared to result from a number of sources, including observing the behaviour of other people when using, hearing first-hand accounts of drug-related experiences from peers, hearsay and media stories. Expectancies were frequently modified as experience increased to take into account other factors, such as dose or current physical or psychological state. These findings are contrary to the literature on alcohol expectancies, which has

suggested that although expectancies are likely to become more refined as an individual gains more experience of consumption, they are generally stable over time (Goldman et al., 1991) and are similar to trait-like beliefs (Young et al., 1990). Overall, it should be noted that holding positive expectancies regarding the use of a substance did not necessarily lead to use: this appeared to be more closely linked to the perceived functions for substance use.

The experience of negative effects in association with substance use was widespread in the sample. Respondents often described similar types of negative effects in association with different drug types. The most common consequences highlighted in the data included vomiting or nausea, feeling anxious, using a stronger dose than intended and wanting the effects of a drug to stop. Some also described taking risks or having accidents when intoxicated. Three general responses to negative experiences were identified in the data. Users either i) accepted the negative effects as an occupational hazard of using psychoactive drugs; or ii) modified their behaviour to reduce the likelihood of similar negative experiences in the future or iii) subsequently abstained from use. These findings could raise questions concerning the likely effectiveness of trying to prevent drug use by highlighting potential negative effects associated with use. This issue is investigated further using quantitative data in studies Two and Three.

Finally, the importance of functions for substance use in determining behaviour was highlighted in the data. A number of different purposes for substance use spanning five domains were identified. Clearly there was clearly a certain amount of commonality in functions for use between drugs, although different substances were also used for different purposes. Study Two examines whether or not a common set of function items is relevant across different drug types.

It was also apparent that use might serve several different functions for an individual simultaneously. For example, drinking alcohol to feel less depressed might also help the user to feel less inhibited and more confident in a social situation. It was not possible to ascertain from the data whether or not there tends to be a primary motivating function for use. What was also unclear was the extent to which functions for substance use were consciously considered before substance use was engaged in and the extent to which the accounts given in the interviews were entirely constructed retrospectively. It is possible that the interpretations offered in this section over-

rationalise drug consumption and that in practice use is more indiscriminate than described here. The second study offered the opportunity to test the extent to which functions for drug use were measurable and whether they were related to other variables in a systematic way or were merely random.

3.6 Chapter summary

This chapter described the first of the three studies presented in this thesis. This qualitative study was designed to examine factors that a group of young people reported as influential on their substance use. The purpose of this study was to inform the identification of domains and measures for the subsequent quantitative studies in this research programme (described in Chapters Four and Five).

The influences identified in the data presented were categorised as demographic, social environment, and individual level influences. Specific factors included gender, drug availability, peer influence, expectancies, negative effects and functions for substance use. The findings presented in this chapter should not be interpreted as indicative that other factors previously noted in the literature did not influence substance use for this group of young people. The list of factors identified was not intended to be comprehensive, but rather an indication of some of the more salient influences from the perspective of the user. These findings provided a basis for selecting a set of measures to address the key aim of the thesis: to model consumption patterns, problems and future expectations. Having identified a range of key factors from the findings in this first study, the next step was to identify suitable measures to assess them quantitatively. This was the aim of the second study described in the next chapter. Study Two also aimed to develop scales to measure functions and negative effects associated with drug use using a common set of measures across different drug types. The second study also tested the proposed statistical approach to modelling substance use and tested the feasibility of using the scales and additional measures in these models. Chapter Four describes this second study and discusses how the key findings subsequently informed the development and execution of the main study.

CHAPTER 4: TESTING AN ANALYTICAL APPROACH FOR MODELLING FREQUENCY OF SUBSTANCE USE AND FUTURE EXPECTATIONS

4.1 Introduction

This chapter describes the second of the three studies in this thesis. It builds on the findings from the qualitative study described in the previous chapter. In this second study, quantitative techniques are used to explore patterns of substance use in a group of young people. The qualitative study (Study One) identified a number of influences on drug consumption from the perspective of the individual user. The purpose of this was to facilitate the selection of a pool of measures from which to develop a quantitative approach to modelling drug consumption in Study Two, which would then be tested further and refined in the main study (Study Three). A range of demographic, environmental and individual influences on drug-related behavioural patterns were identified in Study One, including gender, age, availability of drugs, peers, expectancies, negative effects and functions for substance use. Study Two builds on these findings by identifying and developing suitable measures to assess these factors and examining the feasibility of using such measures to model substance use in a sample of young people. This was judged to be an economical way to test the proposed approach to explaining substance use before using it on a larger sample in the main study (Study Three).

4.1.1 Dependent variables

Two sets of dependent variables (DV) were selected for modelling: current frequency of use and future use expectations. The aim was to model each DV for five different drug types in order to compare and contrast relative influences across different substances. The five substances chosen for study were alcohol, cannabis, amphetamines, ecstasy and LSD, as these were the most common drugs used by respondents in Study One, as well as being the most prevalent in the wider literature on young people in the UK (e.g. Ramsay & Spiller, 1997; HEA/BRMB, 1997).

4.1.2 Independent variables

Study One identified substance-use functions and negative effects as key influences on patterns of behaviour. This second study provided the opportunity to develop and test measures to assess these two factors.

Other influences identified and discussed in Study One included availability and expectancies. However, although important influences on drug consumption, these were not included as measures for the following reasons. Data from Study One suggested that availability was most likely to influence which drug types were selected on a specific occasion, rather than how frequently a particular substance was consumed (which had been chosen as a DV in the current study). Furthermore, the availability of alcohol was unlikely to vary substantially. Instead, peer substance use was chosen as a suitable proxy for how available certain drugs were to individual respondents. At the time of the study, although validated instruments to measure alcohol and cocaine-related expectancies had been published (e.g. Fromme et al., 1993; Brown et al., 1980; Jaffe & Kilbey, 1994), there were no similar scales for the other drugs being studied. A key principle of the research approach was to use uniform measures for all drugs (to enable models for different drugs to be compared directly). As this did not appear to be possible for expectancies, they were excluded from the questionnaire. However, for two reasons, it was not anticipated that this would yield problems given the decision to include measures for substance use functions. First, as argued in Chapter Three, functions appear to be more proximally related to the behaviours in question than expectancies. Second, functions for use include an element of expectancies, too: if someone reports using a drug to help lose weight, then it logically follows that they 'expect' that particular drug to curb their appetite or alter their metabolism in some way.

4.1.3 Study hypotheses

This section presents an overview of the background literature that led to the construction of the four main hypotheses tested in this study. Much of this work has already been discussed in detail in Chapter One so is only briefly described here.

In a variety of social behaviours, past behaviour has been shown to be a strong predictor of future behaviour (e.g. Mullen et al., 1987; Godin et al., 1993; Sutton, 1994; Norman & Smith, 1995) and there is evidence in the literature to support this

relationship in the case of drug-using behaviours (e.g. Bentler & Speckhart, 1979; Bachman et al., 1984; Newcomb & Bentler, 1986; Newcomb, 1995). In the absence of longitudinal data, expected future behaviour is used as a relatively robust alternative indicator (see Warshaw & Davies, 1985). It therefore seems likely that people who report more frequent recent use of a drug will report stronger expectations that their use will continue in the future.

However, when use has taken place in the past, it does not necessarily follow that use will continue and a variety of factors are likely to have an impact on this. In particular, the impact of negative effects may affect future use. As discussed in Chapter One, to date, a common prevention approach has been to focus on the potential negative effects that users risk experiencing when they consume a drug. The rationale behind this is that if young people are aware of the potential negative consequences of drug use, they are less likely to engage in use. However there is little research evidence to back up this assumption (Huba et al., 1986). There is also limited evidence that actually experiencing negative effects from substance use will lead to abstinence. Three different responses to the experience of negative consequences were identified from the data in Study One: users either abstained from use altogether, modified their use or accepted the negative effects as part of the drug-using experience. The present study tests the relationship between negative effects and patterns of substance use and future expectations.

Chapter One summarised the literature on reasons and motivations for substance use. Overall, studies have demonstrated a positive relationship between the number of reasons or motivations reported for alcohol use and consumption patterns (e.g. Glynn et al., 1983; Carman et al., 1983; Goodwin, 1990; Plant et al., 1990; Smith et al., 1993; Foxcroft & Lowe, 1993; Cronin, 1997; Bradizza et al., 1997; Williams & Clark, 1998). A similar relationship has been noted in the drugs literature (Carman, 1979; Johnson & O'Malley, 1986; Simons, 2000). For example, Newcomb and associates (1988) reported that the more reasons people cited for their drug and alcohol use, the more frequently they used these substances. Similarly, Sadava (1973) noted that heavier drug use was associated with more functions for use. Given the similarity between 'reasons', 'motivations' and 'functions' discussed in Chapter One (see section 1.7.6), one might expect similar relationships to be observed in this study.

Finally, there is substantial evidence in the literature linking an individual's patterns of substance use with that of their peers. Peer use has consistently been found to be one of the strongest predictors of substance use in young people (Kandel et al., 1978, 1986; Jessor et al., 1980; Elliott et al., 1985; Barnes & Welte, 1986; Kandel & Andrews, 1987; Brook et al, 1990). Data from Study One also supported this association. These findings suggest that the more substance-involved an individual perceives their peer group to be, the more heavily they will use substances themselves. On the basis of this, a positive association between measures of peer substance use and individual substance use would be expected in the current study. In summary, the literature and findings from Study One led to the development of the following four hypotheses:

Hypothesis 1

There will be a strong positive relationship between current patterns of substance use and future use expectations.

Hypothesis 2

The greater the extent to which users recognise functions for their use of a particular substance, (a) the greater the current frequency of use and (b) the stronger the expectations that use of the substance will continue in the future.

Hypothesis 3

An individual's substance use will be positively associated with the substance use of their peers.

Hypothesis 4

Experience of negative effects from use of a substance will result in the user (a) using the substance less frequently and (b) reporting weaker expectations that they will use the substance again in the future.

4.2 Method

The study design was a cross-sectional survey that used a short structured questionnaire. Data were collected between November 1997 and February 1998. This section describes the methods and procedures used to collect and analyse the data.

4.2.1 Participants

One hundred young people aged between 16 and 22 years, completed a short, interviewer-administered, structured questionnaire[1]. Respondents were recruited from southern England using snowball sampling techniques with nine starting points (a nursing student, a university student, three young people studying at different colleges for GCSE's or A-levels, a drug seller, two unemployed young people and a youth worker). As discussed previously (see Chapter Two), this recruitment technique is an effective way of generating samples from a hidden population where no formal sampling frame is available (Van Meter, 1990). A purposive sampling procedure (Spooner & Flaherty, 1992) was used to recruit a sample of young people who were anticipated to have a higher level of substance use involvement than would be expected from a randomly generated sample given current population prevalence estimates (Ramsay & Spiller, 1997, HEA/BRMB 1997). This approach was adopted to ensure that sufficient data were available to test the hypotheses. Sampling was not therefore intended to yield a representative group of young people between 16 and 22 years.

4.2.2 Instrument development

A structured questionnaire was developed and piloted specifically for data collection in this part of the study. Items were drawn from the following seven measurement domains:

- Demographics
- Substance use history
- Current patterns of substance use (past 90 days)

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[1] *These interviews have been separately analysed and published elsewhere: Boys, A., Marsden, J., Fountain, J., Griffiths, P., Stillwell G, & Strang J. (1999b). Substance use amongst young people: the relationship between perceived functions and behavioural intentions. Addiction, 94 (7), 1043-1050. (see Appendix H).*

- Functions for substance use
- Negative effects
- Future use expectations
- Perceived peer substance use

This section provides an overview of the measures used in each of these domains and describes how the scale items were developed.

Demographic variables

Participants' age, gender, ethnic origin, educational qualifications, occupation and living circumstances were recorded using a combination of discrete category-based items (for gender, type of current accommodation and with whom they were sharing accommodation) and open ended questions (with answers recorded verbatim and then numerically coded at the data entry stage).

Substance use

To get an overall picture for each respondent of the extent of their substance use experience, the questionnaire assessed lifetime and current use of nine substances (cigarettes, alcohol, cannabis, amphetamines, ecstasy, LSD, heroin, 'other opiates' and benzodiazepines), using the measures described in Chapter Three (see section 3.2.3.1).

Future expectations

To complement the substance-use measures described previously, respondents were also asked about their future use expectations. Most studies of young people and substance use have measured the number of people who have used a drug either within a recent confined period (e.g. past month) or across their whole lifetime. In describing the data, the researchers then refer to 'lifetime users' and 'current users', defining the latter as those who have used the drug within the recent confined period of time. This approach could be described as lacking in sensitivity as it does not allow for the case in which respondents are describing recent experimental use rather than 'current use' and do not intend to continue with this behaviour. One method of addressing this weakness is to conduct a longitudinal study and to measure substance use at several points, thus

improving the overall picture of the extent of an individual's behaviour. However, such studies require considerable resources. An alternative approach is to ask individuals about their future expectations regarding use of a particular substance. Individuals may be asked to rate the likelihood of consuming a drug in the future or if (and how) they are intending to change their patterns of use in the next few months. Due to space and time limitations, the current study used just one measure based on those used by Warshaw and Davis (1985). Warshaw and Davis defined behavioural expectations as *"the individual's estimation of the likelihood that he or she actually will perform some specified future behaviour"* and argued that behavioural expectations are more accurate predictors of behaviour than intentions (Warshaw & Davis, 1985). For each substance that they had tried, respondents were asked to rate the *likelihood* that they would use it again within the next 12 months on a seven-point scale with 'very unlikely' and 'very likely' at each pole (scoring 1-7). Prompt cards were used to facilitate responses.

Functions

Although distinct from reasons for use as argued in Chapter One, functions for substance use could be described as similar constructs in terms of measurement. A review of the literature on measurement approaches for reasons and motivations for substance use led to the identification of three different methods of measuring reasons for drug use:

i) *Instruments developed to measure alcohol reasons have been modified (for example, Simons et al., (2000) modified the Drinking Motives Measure (DMM) developed by Cooper et al., 1992; 1995; Cooper, 1994).*

ii) *A unique set of measurement items have been constructed specifically for the study (e.g. Jung, 1977; Farber et al., 1980; Glynn et al., 1983; Goodwin, 1990; Klein 1992; Smith et al., 1993; Bradizza et al., 1997).*

iii) *Open ended questions have been used to generate reason items (e.g. Robbins et al., 1970; Buchanan, 1993).*

In the absence of any previously validated instruments, a combination of approaches ii) and iii) was used to construct a number of items based on the results from Study One. As the current study was exploratory, just two of the function domains identified in Chapter Three were used to develop items for a functions scale. Domains concerned with social functions and functions pertaining to moderating mood were chosen, as these were broadly in line with categories of reasons and motivations noted in the literature (e.g. Farber et al., 1980; Segal et al., 1980; Ratliff & Burkhart, 1984; Cooper et al., 1988; Haden & Edmundson, 1991; Carey & Correia, 1997; Bradizza et al., 1997; Williams & Clark, 1998) and also appeared to be most widely applicable to the drugs under study. Four mood items and five social items were developed based on the findings reported in Chapter Three. These items are written in full in table 4.4 of the results section in this chapter. The items were randomly ordered prior to data collection. Participants were asked to indicate how often they had used each target substance for the nine functions during the 12 months prior to interview. Responses were recorded using a five-point Likert-type scale ('never' to 'always', scored 0 to 4). Again prompt cards were used to facilitate responses.

Negative effects

As with the functions scale, the items for the negative effects scale were derived from the findings from Study One. The aim was to develop items that were likely to be relevant to users of each of the five target substances. A set of four items for the negative effects scale was generated. One statement was discarded after piloting: *"How often have you wished you hadn't decided to take or use [drug] while feeling the effects?"*. This item worked well for the longer-acting drugs such as ecstasy or LSD (which may be taken as a single dose). However, for other drugs, such as cannabis and alcohol (where doses tend to be repeatedly ingested during a using episode), a user might wish that they had consumed less on a particular occasion rather than not having used any of the substance at all. The remaining three items in the scale were as follows: How often have you *"felt sick or unwell"*, *"taken more or a stronger dose than you would have liked to"* and *"wished the effects would reduce or stop"* when using [drug]? Responses to these items were recorded in a similar way to the functions scale, using a five-point scale ('never' to 'always', scored 0 to 4) illustrated on a prompt card.

Perceived peer substance use

Two items measured the respondents' perceptions of the extent of their friends' use of the five target substances. First of all, respondents were asked to estimate the proportion of their friends who had ever used each of the substances. They were then asked to estimate the proportion that they thought would use each of these substances again within the next six months (as a indicator of perceived current peer drug involvement). Again, both items used a five-point Likert-type scale ('none' to 'all', scored 0 to 4) illustrated on a prompt card.

4.2.3 Procedure

Interviews were conducted by the author in informal community settings selected by the interviewee (such as cafés, pubs, parks and student unions). Before the interview commenced, the interviewer explained the purpose of the study, provided the respondent with a printed information sheet about the study (see appendix F) and gave the respondent the opportunity to ask questions about their participation. It was stressed that any data collected would remain anonymous (with only a code number to identify the questionnaires) and that no one other than the research team would have access to the data. Potential respondents were also informed that their participation in the study was voluntary and that they were free to refuse to answer questions or to terminate the interview at any point should they so wish (none of the participants exercised these rights). Respondents received expenses for travel and £5 to compensate them for the time they spent being interviewed.

After obtaining written informed consent from the participant (see appendix G for copy of the consent form), the interview proceeded. Each interview took between 10 and 20 minutes to complete. The study was conducted in accordance with standard research ethical practices as detailed in Chapter Three (section 3.2.4.1) and was approved by the Research Ethics Committee of the Bethlem and Maudsley NHS Trust.

4.2.4 Data Validation

The data entry (DE) module of the statistical package SPSS/PC+ was employed for data entry and validation, identification and resolution of errors (Norusis, 1990). Three

measures were taken to ensure the accuracy of the data: first, data were coded before data entry took place. Second, the accuracy of the three data files was checked using the data-cleaning branch of the DE programme. During this process, variables were checked against valid entry-range specifications and corrected by consulting the original questionnaires where necessary. Wherever this process was necessary, ten variables either side of the erroneous one were simultaneously checked against the questionnaire. Logical data coding errors were also identified and corrected. For example, someone who indicated that they had used cannabis in the last three months must also have used this drug in the past year. Once all such changes had been made, the file was then re-checked using the same procedures.

4.2.4.1 Outlier management

In the final stage of data validation, the FREQUENCIES programme (SPSS Windows, version 8.0) was used to check for the presence of univariate outliers in the data. Outliers are extreme values in relation to those observed in the sample as a whole. Such outliers might suggest within range but incorrect values having been assigned to variables. Once identified, the values were once again checked against the original questionnaires and amended if necessary. The impact of extreme cases on analyses can be considerable, particularly with a moderate sample size. The method recommended by Tabachnick and Fidell (1996) for outlier management was applied to the dataset: all values that were greater than 3.29 standard deviations above the mean were identified and recoded to be one unit larger than the most extreme score within the defined parameter.

4.2.4.2 Missing data

As questionnaires had all been completed by the author and had been thoroughly checked at the end of each interview, missing data were rare. Where a question had been omitted in error, the answer could often be extrapolated from other answers. Where such extrapolations were not possible, missing values were replaced with the mean value for similar cases as recommended by Tabachnik and Fidell, (1996, p.63). For example, if the data on typical amount used was missing for a 16-year-old daily cannabis user, the mean typical daily amount for other 16-year-old daily cannabis users

was substituted. This method is preferable to inserting the overall mean for the sample as it is less conservative.

4.2.5 Data Analysis

In addition to descriptive analyses, a number of bivariate and multivariate statistical tests were employed. Chi-squared tests were used for the analysis of proportions. Scale-based and continuous measures were analysed using Pearson's correlation coefficients (r) (for bivariate comparisons), and t-tests for the comparison of two mean scores. Cronbach's alpha coefficients were calculated to assess internal reliability of the scales used. Cronbach's alpha assesses the internal consistency of a set of items by examining the inter-item correlations. It indicates the extent to which the items appear to measure the same underlying construct. Finally, the data were analysed using standard multiple regression analyses. Multiple regression can be undertaken to explore the relationship between a response measure (such as a scale score) and several predictors (or independent variables). This process yields an equation that represents the optimal prediction of a particular response measure by calculating a series of values (called beta coefficients) based on the scores for the predictors. In the standard multiple regression model, all of the independent variables (IVs) are entered into the analysis at once and each is evaluated in terms of its contribution to the regression equation in relation to all other predictors.

In all tests reported in this chapter, only results that were significant at the 0.05 level or below are reported. A general principle of reporting three significant figures has been adopted.

4.3 Results

4.3.1 Descriptive statistics

The following section summarises the descriptive statistics for the key variables from the dataset. SPSS version 8.0 for Windows was used to analyse the data. Firstly, the sample demographics are presented followed by data on patterns of substance use and other key variables.

Before conducting the main data analyses, t-test and chi squared statistics were calculated to assess all variables for demographic differences (by age and gender).

Where significant differences were observed, the findings are reported in the text in each relevant section.

4.3.1.1 Demographics

One hundred young people were interviewed (45 females). Their average age was 18.8 years (range 16-22). There were no significant gender differences in age (mean age for males = 19.0 years, mean age for females = 18.6 years; $t_{[98]}$=1.27, p=0.207). Just under three quarters (74%, 74) described themselves as 'white European', 17 reported their ethnic origin to be 'African-Caribbean' or 'Black British', six as 'Asian' and three as 'mixed race'. Thirty-seven respondents were living with their parent(s), 21 were living in temporary hostels or were of no fixed address and 42 were in rented accommodation. Most of the sample (69) were in some form of education at the time of interview, 16 had full-time work and 15 were formally unemployed.

4.3.1.2 Substance-use history

All respondents had used alcohol, 94 had smoked at least one cigarette and 89 reported using cannabis at some point in their lives. For the other six substances assessed, lifetime use was as follows: 56 had used illicit amphetamines, 38 had used ecstasy, 35 had used LSD, 13 had used heroin, six had used illicit benzodiazepines and five had used illicit opioids. Six respondents reported intravenous drug use at some point in their lives and two had injected a drug within the three months prior to interview. None of the participants reported any treatment episodes for substance-related problems.

Table 4.1 presents a summary of the prevalence for lifetime, past year and current (past 90 days) substance use together with mean age of first use by drug. Analyses of these variables by gender and age can be found in tables J1 to J3 in the appendix J.

Table 4.1 Lifetime prevalence, age of onset and past year prevalence for nine substances (n=100)

Substance	*Lifetime use*	*Mean age of first use*	*Past year use (% ever)*	*Past 90 days (% ever)*
Cigarettes	94	13.3	75 (80%)	73 (78%)
Alcohol	100	14.1	99 (99%)	93 (93%)
Cannabis	89	14.7	80 (90%)	66 (74%)
Amphetamines	56	16.3	34 (61%)	23 (41%)
Ecstasy	38	17.0	28 (74%)	22 (58%)
LSD	35	16.5	15 (43%)	12 (34%)
Heroin	13	18.6	7 (54%)	3 (23)%)
Opioids	5	19.0	2 (40%)	2 (40%)
Benzodiazepines	6	17.0	2 (33%)	2 (33%)

Few significant age or gender differences were observed on these variables. Males in the sample were more likely to have ever used heroin ($\chi^2_{[1]}$=5.62, p<0.05) and to have used cannabis and LSD during the year prior to interview ($\chi^2_{[1]}$= *5.04*, p<0.05*;* $\chi^2_{[1]}$=*6.37*, p<0.05*)* than their female counterparts. Those who reported lifetime use of ecstasy, LSD, heroin and benzodiazepines were significantly older than those who had not used these drugs. Use of cigarettes in the past year ($t_{[36]}$=-2.69; p<0.05) tended to be associated with younger respondents.

Lifetime polysubstance use was common: the mean number of different substances ever used (excluding cigarettes) was 3.5 (range 1-8; median = 3; mode = 2; sd =1.80). There were no significant gender differences observed in the total number of drugs used (males = 3.75; females =3.09; $t_{[98]}$ = 1.92, p=0.06).

4.3.1.3 Current patterns of substance use

Table 4.1 also summarises data for drug use over the 90 days prior to interview. The substances used by the greatest proportion of respondents during the 90 days prior to interview were alcohol (93) cigarettes (73) and cannabis (66). Twenty-three interviewees had used amphetamines, 22 had used ecstasy and twelve respondents

reported that they had used LSD during this time period. Gender differences were relatively uncommon: male respondents were more likely than females to have consumed LSD in the past 90 days ($\chi^2_{[1]}=6.08, p<0.05$) and females were more likely to report recent use of amphetamines ($\chi^2_{[1]}=6.12, p<0.05$).

Patterns of current substance use were measured in terms of 'frequency' and 'typical amount' used. Table 4.2 summarises the data for these variables for use of each drug during the 90 days prior to interview. Males reported using cannabis more frequently than females during the 90 days prior to interview ($t_{[64]}=2.51, p < 0.05$). No other significant differences in the recent frequency of substance use were found by gender. Gender differences in the average quantity of use were observed for alcohol and cannabis only. Males reported smoking 5.6 cannabis cigarettes (or 'joints') on a typical day (range 1-14) and females reported smoking 2.5 cannabis joints (range 1-8) ($t_{[64]}=4.60, p < 0.001$). For alcohol, male drinkers consumed an average of 9.5 standard units on a typical using day (range 2-17 units) in contrast with females, who drank an average of 7.2 units (range 1-16 units) ($t_{[90]}=2.42, p < 0.05$).

Table 4.2 Patterns of drug use (frequency and typical amount) in the past 90 days

Substance (number recent users)	*Mean days used*			*Mean typical amount on 'using day'*		
	mean	s.d.	range	mean	s.d.	range
Alcohol (n=93)	37.6	29.1	1-90	8.5 units	4.7	1-17
Cannabis (n=66)	34.5	36.1	1-90	4.5 "joints" [2]	3.5	1-14
Amphetamines (n=23)	5.0[1]	10.1	1-40	1.3 grams	0.8	0.075-3.0
Ecstasy (n=22)	5.4	8.2	1-26	1.5 tablets [3]	0.8	0.5-3.0
LSD (n=12)	10.0	15.1	1-51	1.6 tabs	0.9	1-3

[1] One respondent reported daily amphetamine use. This outlier was recoded to one unit above the next highest frequency recorded (40 days) to give a more representative mean.
[2] Two respondents reported smoking 25 and 30 cannabis 'joints' on a typical day. These outlying values were recoded to one unit above the next highest amount recorded (14 cannabis 'joints').
[3] One ecstasy user reported typically using six tablets. This outlying value was recoded to three tablets to ensure a more representative measure of mean amount.

Due to the low number of cases reporting current LSD use (12), this drug was omitted from further analyses.

4.3.1.4 Future expectations

Respondents who had 'ever' used a drug were asked how likely they thought it was that they would use that particular substance again within the next 12 months (scored 1-7 where 7 represented 'very likely'). The strongest expectations were reported for alcohol (5.22) and then cannabis (4.58). Table 4.3 summarises the mean scores and standard deviations by drug.

Table 4.3 Expectations regarding use of four substances in the next 12 months

Substance	*mean*	*s.d.*
Alcohol (n=100)	5.22	1.45
Cannabis (n=90)	4.58	1.94
Ecstasy (n=54)	2.97	2.53
Amphetamines (n=70)	2.59	2.37

Females reported stronger expectations that they would use amphetamines in the next 12 months than males ($t_{[68]}$=*-2.62; p*<0.05*)*. In contrast, males reported stronger expectations that they would use cannabis within this time period ($t_{[64]}$=*2.26; p*<0.05*)*.

4.3.1.5 Functions for substance use

Table 4.4 summarises the proportion of users who endorsed each of the nine function items for their substance use during the year prior to interview. The most popular function for using cannabis and alcohol was *"to relax"* (95% and 79% of users in the past year respectively). For the two stimulant drugs (ecstasy and amphetamines), the most popular function for using during this time period was using *"to keep going"* (91% of amphetamine users and 89% of ecstasy users).

Each item was scored on a Likert-type frequency scale ('never' to 'always', scored 0 - 4). The average scores are also presented in table 4.4 together with Roman

numerals to indicate the top five scores in rank order for each substance. Scores for each of the nine items were summed to give an overall functions scale score for each drug (maximum possible score=36). Mean scores on these scales were as follows: alcohol=13.6; cannabis=12.9; ecstasy=12.9; amphetamines=10.3. There were no significant gender differences observed in the total functions scale scores for any drug.

Table 4.4 Summary of reported functions associated with use of four drugs during the past year, together with scale totals and Cronbach's alpha coefficients

Function item	Alcohol (n=100)			Cannabis (n=89)			Amphetamines (n=56)			Ecstasy (n=38)		
	n	%	*mean*	n	%	*mean*	n	%	*mean*	n	%	*mean*
To feel better when low or depressed? *["to feel better"]*[1]	71	72%	1.55 [v]	60	75%	1.63 [iv]	13	38%	0.68	13	46%	0.93
To help you to relax? *["to relax"]*	78	79%	1.79 [iii]	76	95%	2.64 [i]	7	21%	0.47	10	36%	0.57
To help you to feel more confident in a social situation? *["to increase confidence"]*	62	63%	1.51	35	44%	0.79	18	53%	1.12 [iv]	18	64%	1.36 [v]
To help you to let go of inhibitions? *["to lose inhibitions"]*	74	75%	1.66 [iv]	43	54%	0.99	17	50%	0.94 [v]	19	68%	1.57 [iv]
To get intoxicated? *["to get intoxicated"]*	75	76%	1.95 [i]	55	69%	1.59 [v]	24	71%	1.59 [ii]	21	75%	2.07 [ii]
To help you to keep going on a night out with friends? *["to keep going"]*	65	66%	1.41	31	39%	0.79	31	91%	2.59 [i]	25	89%	2.46 [i]
To help to make an everyday activity less boring? *["to decrease boredom"]*	47	47%	0.87	58	73%	1.74 [iii]	14	41%	0.82	11	39%	0.75
To enjoy the company of your friends? *["to enjoy company"]*	73	74%	1.88 [ii]	54	68%	1.76 [ii]	20	59%	1.15 [iii]	22	79%	1.64 [iii]
To help you to feel closer to someone? *["to feel closer"]*	49	49%	1.01	43	54%	0.96	14	41%	0.68	18	64%	1.57 [v]
MEAN TOTAL SCALE SCORE			13.6			12.9			10.3			12.9
Cronbach's alpha coefficient			0.89			0.82			0.82			0.81

[1] *Abbreviations for these items shown in brackets are used throughout the rest of this chapter.*

[i-v] *indicates the top five mean scores in rank order for each substance*

Chi squared tests revealed just one significant gender difference among the function items endorsed for use of the four drugs during the past year: males were more likely to report using cannabis to help them *"to relax"* than their females counterparts (Fisher's exact test[1], $p<0.05$). Age differences were observed for cannabis only: those who reported using cannabis in the last year to help them *"to increase confidence"* ($t_{[78]}$=-2.23, $p<0.05$), *"to lose inhibitions"* ($t_{[78]}$=-2.23, $p<0.05$), *"to decrease boredom"* ($t_{[56]}$=-2.71, $p<0.01$), or to *"to enjoy company"* ($t_{[61]}$=-3.794, $p<0.001$) were significantly younger than those who did not endorse these items. T-tests were also calculated to assess for gender differences in scores for each item on the Likert scales. Just two function items were found to differ (both for cannabis): using *"to keep going"* ($t_{[77]}$=2.33, $p<0.05$) and using to *"to decrease boredom"* ($t_{[78]}$=2.26, $p<0.05$). In both cases, scores for male users were significantly higher than those for females. More detail regarding these calculations is presented in table J4 in appendix J.

Scale reliability

A key objective for this study was to assess the reliability of the functions and negative effects scales. Kerlinger (1973) defined reliability *as "the accuracy or precision of a measuring instrument"* (p.443). The reliability of the scales developed in this study was assessed using Cronbach's alpha coefficient of reliability as the criterion index of performance (Cronbach, 1951). The closer the alpha is to 1.0, the greater the internal reliability. An alpha in excess of 0.6 indicates that the scale has acceptable reliability (Cohen & Cohen, 1983). Cronbach's alpha coefficients for the four functions scales are presented in table 4.4. Values ranged from 0.81 (ecstasy) to 0.89 (alcohol), with an average of 0.84 across the four drugs.

4.3.1.6 Negative effects scale

Table 4.5 summarises the proportion of users who reported ever having experienced each of the three negative effect items in association with their use of the four drugs. Negative effects were most closely associated with alcohol use, with more than 85% of the sample reporting that they had experienced each effect in association with their use of this drug at some point in their lives. The most frequently endorsed effect was

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[1] *Fisher's exact test can be used when the smallest expected frequency is less than 5 (Cochran, 1954).*

"*wished that the effects would reduce or stop*" (94%). Negative effects associated with the use of ecstasy and amphetamines were less widespread among lifetime users of these drugs. The most common item endorsed by ecstasy users was *"felt sick or unwell"* (63%), which was reported by significantly more male (18) than female (6) users ($\chi^2_{[1]}$= *3.93, p*<0.05*)*. For amphetamines, the most frequently reported negative effect was "*wished that the effects would reduce or stop*" (50%). There were no significant gender differences in negative effects reported by cannabis, alcohol or amphetamine users. T-tests did not reveal any significant differences by age for any of the negative effect items for the four drugs (see table J5, appendix J).

Scores for the three items were summed to give an overall negative effects scale score for each drug (maximum possible score=12). These totals, along with mean scores for each item, are also presented in table 4.5. Mean scores on these scales ranged from 6.1 (alcohol) to 2.8 (ecstasy and amphetamines). There were no gender differences observed in the total negative effects scale scores for any of the drugs.

Scale reliability

As with the functions scale (see previous section), Cronbach's alpha coefficients were calculated to assess the internal reliability of the negative effects scales (presented in table 4.5). These averaged 0.75 across the four drugs and ranged from 0.60 (cannabis)[1] to 0.83 (amphetamines). However, although the Cronbach's alpha using all cases was relatively low, the scale was retained in its entirety for use in further analyses to enable a consistent analytical approach across the four drugs to be sustained.

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[1] *An examination of the inter-item correlations for cannabis revealed a low correlation between "felt sick or unwell" and "used more than would have like to" (r=0.22; p<0.05). In contrast, all other inter-item correlations were significant at the 0.001 level and exceeded 0.35. Furthermore, five cases were identified as outliers on these two items. Removal of these cases from the group increased the internal relability of the scale from 0.60 to 0.68.*

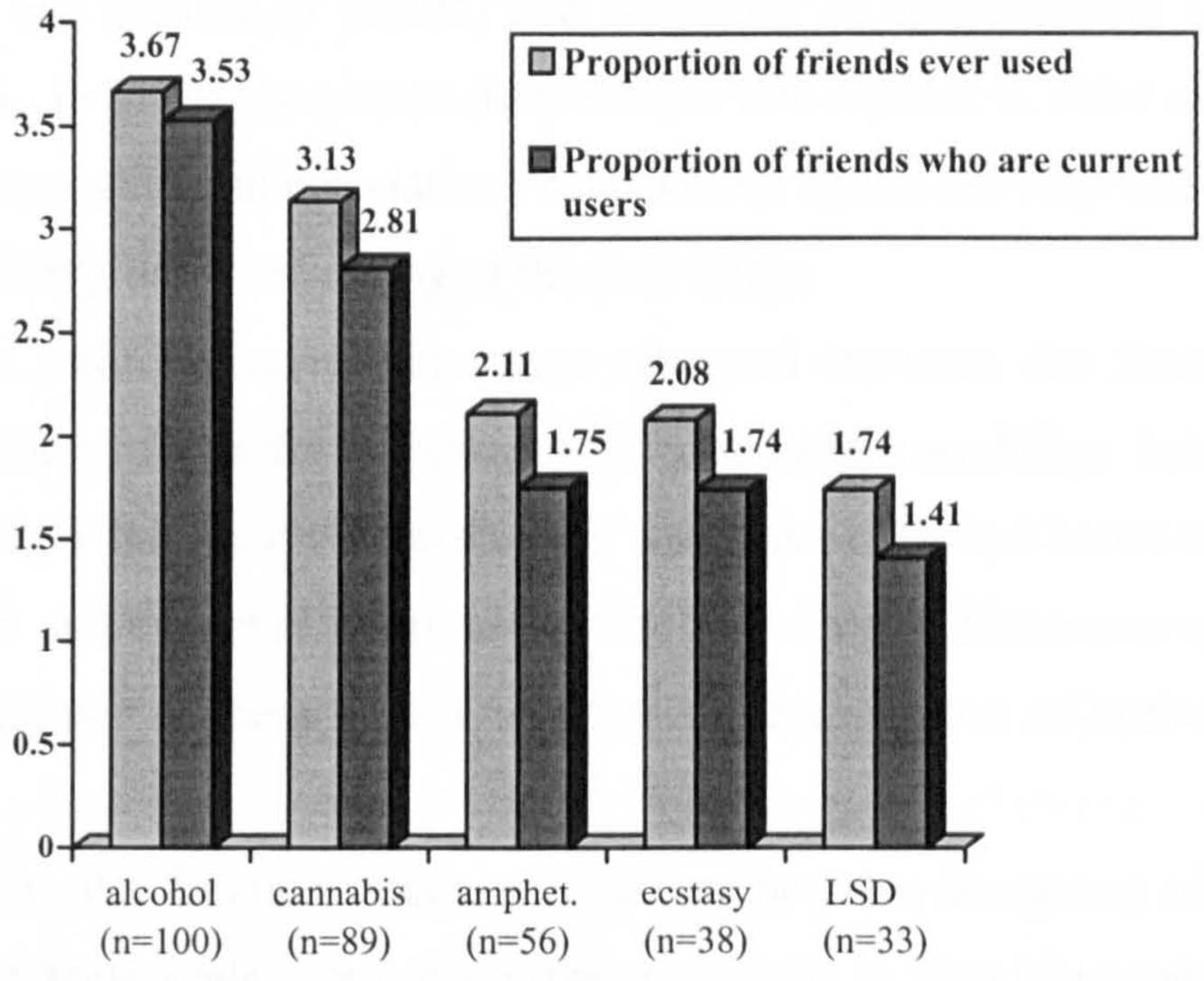
Table 4.5 Summary of reported negative effects associated with lifetime use of four substances, together with scale totals and Cronbach's alpha coefficients

	Alcohol (n=100)			Cannabis (n=89)			Amphetamines (n=56)			Ecstasy (n=38)		
Negative effect item	n	%	*mean*	n	%	*mean*	n	%	*mean*	n	%	*mean*
Felt sick or unwell when using [drug]?	93	93%	2.10	56	63%	0.96	26	46%	0.96	24	63%	1.11
Taken more/a stronger dose than you would have liked to when using [drug]?	89	89%	1.98	51	57%	0.82	24	43%	0.82	18	47%	0.92
Wished the effects would reduce or stop when using [drug]?	94	94%	1.97	57	64%	1.09	28	50%	0.96	17	45%	0.82
TOTAL SCALE SCORE			6.05			2.87			2.75			2.84
Cronbach's alpha coefficient			0.80			0.60			0.83			0.76

4.3.1.7 Peer substance use

Lifetime users of each drug type were asked to report on the drug use of their peers. The first item asked them to estimate the proportion of their friends who had ever used a particular substance and the second asked for the proportion that they thought would use it again within the next six months (as a indicator of perceived current peer drug use). Both items were scored on a five-point Likert-type scale ('none' to 'all' – scored 0 to 4). The mean scores for lifetime use of the five drugs for those who had ever used each of these ranged from 2.08 (i.e. about half of their friends) for ecstasy to 3.67 (i.e. almost all of their friends) for alcohol; for perceived current use scores, ranged from 1.74 (ecstasy) to 3.53 (alcohol). Mean scores are presented in figure 4.1. There were no significant differences in scores by gender on any of these variables.

Figure 4.1 Perceived peer drug use for respondents who had ever used each drug



4.3.2 Inferential statistics

In this section, the bivariate and multivariate relationships between the different measures obtained are examined. First, bivariate correlations between the main variables are presented. These variables are then used to model the current frequency of use and future expectations for each substance. LSD was excluded from these analyses due to a lack of cases.

4.3.2.1 Bivariate correlations

Bivariate correlations between age, gender, current frequency and typical amount used, future use expectations, functions scale scores, negative effects scale scores and measures of peer use for alcohol, cannabis, amphetamine and ecstasy users are presented in tables J6 to J9 in appendix J. Pearson's product-moment correlation coefficients for the age of the respondent and the frequency of use of alcohol, cannabis, amphetamines and ecstasy in the past 90 days averaged 0.20 in absolute value. Pairwise comparisons were non-significant ($p > 0.05$) with the exception of frequency of cannabis use and age (r=0.22, $p < 0.05$) and frequency of amphetamine use and age (r=0.43, $p < 0.05$). In both cases, more frequent use was evident in older users. There were no statistically significant correlations between the age of the respondent and their expectations regarding future use of any of the four drugs.

Significant positive correlations were observed between the functions scale scores and frequency of use for all drugs. The average correlation between these variables was 0.47. High positive correlations were also observed between scores on the functions scale and expected future use of the four drugs. These averaged at 0.50 and were all significant at the p<0.001 level with the exception of ecstasy (r=0.36, p<0.05).

In contrast to the function scales, correlations between frequency of recent use and the negative effects scale were low (averaging 0.10 in absolute magnitude) and were non-significant. Correlations between expected future use and the negative effects scale were also low, averaging 0.07 in absolute value. None of these correlations reached statistical significance.

The tables also show correlations between the two measures of perceived peer substance use and current frequency and future expectations for each substance.

Correlations with current peer use were significant for all drugs except for amphetamines and averaged at 0.42 for frequency of use and 0.35 for future expectations. Correlations between peer lifetime use and these variables were less strong, with only a few reaching statistical significance.

The negative effects scale was statistically independent from the functions scales for all drugs except for alcohol (r=0.22; p<0.05).

Frequency of current use and future expectations regarding use were highly correlated, with an average of 0.55 across the four drugs. This indicates that approximately 31% of the variance in future expectation scores was accounted for by current frequency of use. The next section describes the multivariate analyses conducted to model frequency of current use for each of the four drugs and to examine which of the measured variables could help to explain variance in future expectation scores in addition to current frequency of use.

4.3.2.2 Modelling substance use and expectations

This section is presented in two parts. First, regression analyses designed to model frequency of use for the target drugs are described. In these analyses the dependent variables were ranked to prevent outliers from distorting the regression analyses. This is followed by analyses to model future expectations regarding the use of these drugs. Having established that there were no grounds to expect major differences by gender or by age in the sample, these variables are controlled for in both sets of regressions.

Multicollinearity

Multicollinearity occurs when two variables are very highly correlated. When this is detected, just one of the variables should be used in an equation (Tabachnick and Fidel, 1996, p.84). Tables J6 to J9 in appendix J show that correlations between the two measures of peer use (lifetime and current use) ranged between 0.63 (cannabis) and 0.84 (ecstasy), with an average of 0.76. Due to concerns about multicollinearity, only one of these measures was therefore used in the regression models. The measure for current peer use was selected for inclusion, as in all cases it was generally more strongly correlated with the dependent variables than the measure for lifetime peer use was. None of the other correlations between the main variables exceeded 0.7 and were

therefore not sufficiently high to warrant concerns about multicollinearity (Tabachnick & Fidell, 1996, p. 86).

Modelling current frequency of use

Four separate standard multiple regression analyses (in which all IVs were entered simultaneously) were performed (one for each substance). Five IVs were entered into the equation: age, gender, function score, negative effects score and the extent of current peer involvement for each substance. The ratio of the number of cases to the number of predictor variables for these analyses ranged from 18.6 to 1 (alcohol) to 7.6 to 1 (ecstasy). The latter exceeded the minimum ratio suggested as acceptable for multiple regression analysis by Tabachnick and Fidell (1989, 1996). The results from these multiple regressions are summarised in table 4.6. The table shows the correlations between the dependent variable and the five covariates, the intercept, the standardized regression coefficients (β), and R^2 and adjusted R^2. Further detail on each of these regressions can be found in tables J10 to J13 in appendix J.

Table 4.6 shows that the five IVs entered into the regression equations predicted between 35% (32% adjusted) and 43% (30% adjusted) of the variance in frequency of use during the past 90 days for the four substances. R^2 was significantly different from zero for all four equations (alcohol: $F_{[5,93]}$=10.0, p<0.001; cannabis: $F_{[5,74]}$=9.42, p<0.001; amphetamines: $F_{[5,27]}$=3.74, p<0.05; ecstasy: $F_{[5,22]}$=3.29, p<0.05).

The strongest predictor variable in each regression equation (with the exception of ecstasy) was the functions score, which ranged from β=0.377 (for amphetamines) to β=0.533 (for alcohol). The functions scores were significant predictors at the p<0.001 level in the equations for alcohol and cannabis, and at the p<0.05 level for amphetamines. The perceived extent of peer use was the only predictor variable that reached significance for ecstasy (β=0.532 p<0.01). This variable also made significant contributions to the equations for alcohol (β=0.228, p<0.01) and cannabis (β=0.290, p<0.01). The negative effects scale did not reach significance.

Table 4.6 Summary of standard multiple regressions modelling current frequency of use for alcohol, cannabis, amphetamines, and ecstasy

	Alcohol (n=99)		Cannabis (n=80)		Amphetamines (n=33)		Ecstasy (n=28)	
IVs	*r*	*ß*	*r*	*ß*	*r*	*ß*	*r*	*ß*
Age	0.011	0.071	-0.218*	-0.077	0.262	0.228	0.152	0.035
Gender	0.082	0.113	-0.191*	-0.107	0.337*	0.283	0.055	-0.052
Functions scale	0.532***	0.533***	0.520***	0.420***	0.532***	0.377*	0.425*	0.221
Negative effects scale	0.081	-0.076	-0.137	-0.089	0.151	-0.063	0.017	-0.031
Extent of peer use	0.277**	0.228**	0.418***	0.290**	0.342*	0.185	0.622***	0.532**
Intercept		-31.4		33.9		-27.1		7.65
R^2		0.351***		0.389***		0.409*		0.428*
Adjusted R^2		0.316		0.348		0.300		0.298

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Modelling future substance use

The next set of analyses explored the relationship between frequency of use, functions scores, negative effects scores and perceived peer substance use, and the respondents' substance use expectations. *Specifically, the ability of the function and negative effects* scales to predict future use expectations for each substance was assessed.

Four separate standard multiple regression analyses (in which all predictor variables were entered simultaneously) were performed (one for each substance). In each, the perceived likelihood of using each substance in the next 12 months was the dependent variable with the following predictor variables: age, gender, frequency of recent use, function score, negative effects score and peer use. The cases to covariates ratio for these analyses ranged from 13.3 to 1 (alcohol) to 4.7 to 1 (ecstasy), the latter exceeding a minimum ratio considered acceptable for multiple regression analysis (Tabachnick & Fidell 1989, 1996). The results of these multiple regressions are summarised in table 4.7. The table shows the correlations between the dependent variable and the six covariates, the intercept, the standardized regression coefficients (β), and R^2 and adjusted R^2. Further detail on each of these regressions can be found in tables J14 to J17 in appendix J.

Table 4.7 Summary of standard multiple regressions modelling future expectations for use of alcohol, cannabis, amphetamines and ecstasy

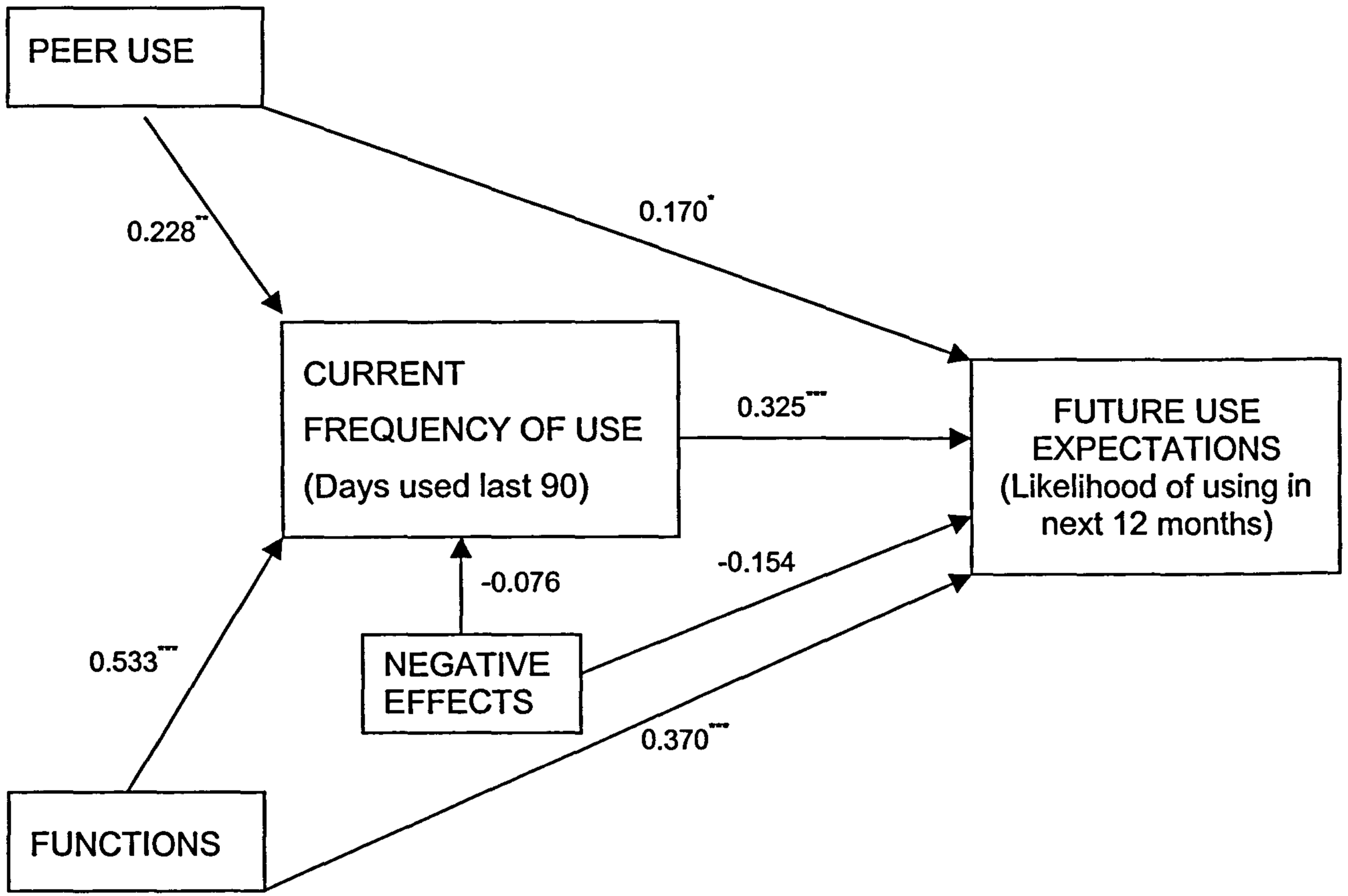
	Alcohol (n=99)		Cannabis (n=80)		Amphetamines (n=33)		Ecstasy (n=28)	
IVs	*r*	*ß*	*R*	*ß*	*r*	*ß*	*r*	*ß*
Age	0.013	0.043	-0.178	0.024	0.242	0.042	0.145	0.008
Gender	-0.059	-0.075	-0.101	0.071	0.266	0.166	0.058	-0.023
Frequency of use	0.534***	0.325***	0.632***	0.429***	0.568***	0.361*	0.477**	0.350
Functions scale	0.517***	0.370***	0.539***	0.327***	0.572***	0.379*	0.361*	0.133
Negative effects scale	-0.004	-0.154	-0.184	-0.123	0.068	-0.132	-0.042	-0.107
Extent of peer use	0.277**	0.170*	0.385***	0.135	0.340*	0.118	0.418*	0.229
Intercept		1.91		1.36		-0.032		2.56
R^2		0.418***		0.510***		0.507**		0.315 *ns*
Adjusted R^2		0.380		0.470		0.393		0.119

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 4.7 shows that the six predictor variables entered into the regression equations predicted between 32% (12% adjusted) and 51% (47% adjusted) of the variance in future use expectations. R^2 was significantly different from zero for three of the equations (alcohol: $a_{6,92]}$=11.0, p<0.001; cannabis: $F_{[6,73]}$=12.7, p<0.001; amphetamines: $F_{[6,26]}$=4.45, p<0.01). The regression model for ecstasy did not reach statistical significance ($F_{[6,21]}$=1.61, *ns)*. This could be due to a lack of power resulting from the small number of cases in the equation (28).

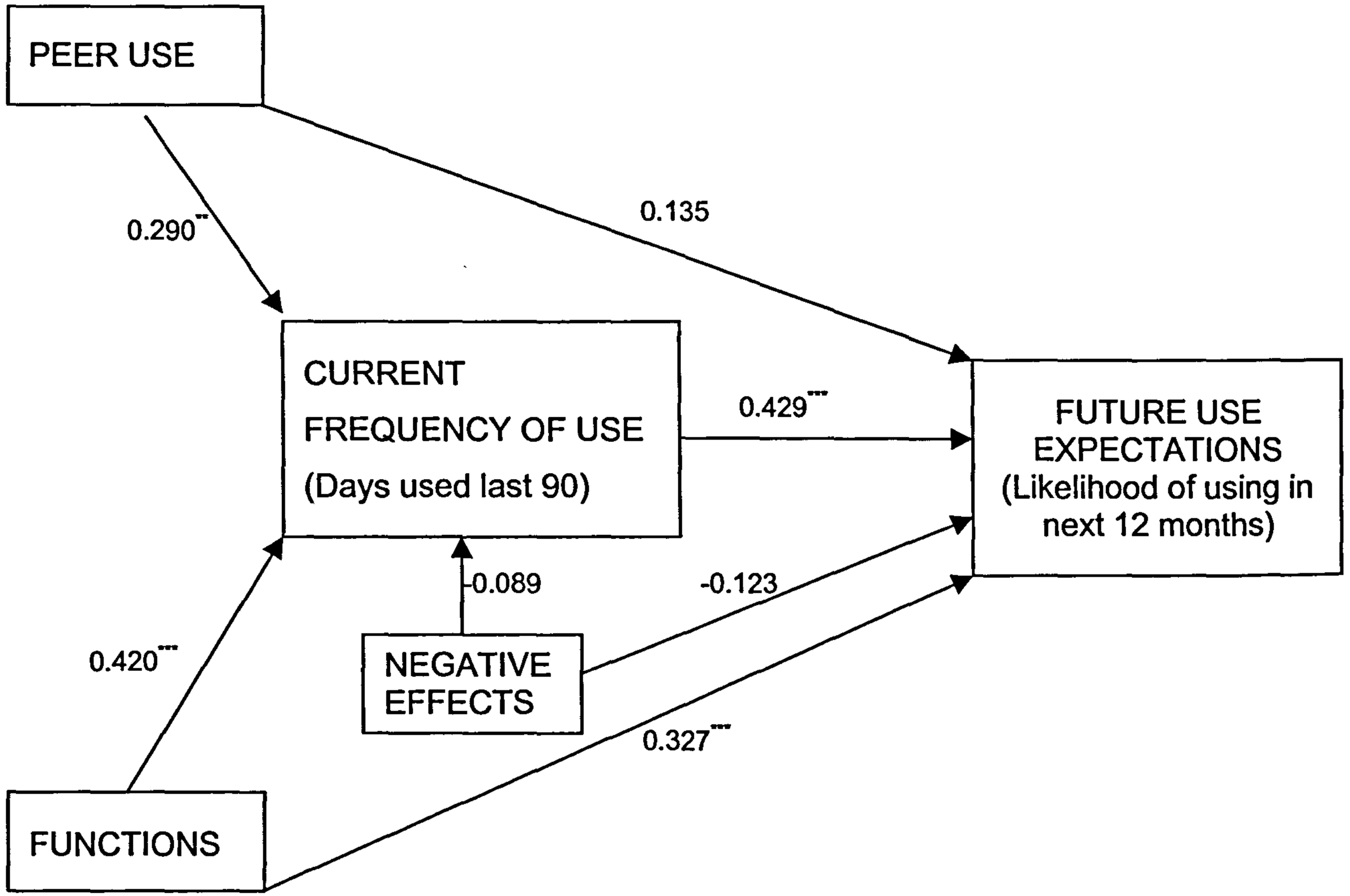
In the regression equations for alcohol and amphetamines, the strongest predictor was the functions scale (β=0.379 for amphetamines and β=0.370 for alcohol). In both cases, the functions scores were significant at the p<0.001 level. For cannabis, the strongest predictor was frequency of use in the last 90 days (β=0.429, p<0.001*)*, although function scores still played a major role in the equation (β=0.327, p<0.001*)*. Frequency of use was also an important predictor in the equations for alcohol (β=0.325, p<0.001*)* and amphetamines (β=0.361, p<0.05*)*. The equation for alcohol was the only one in which three variables reached statistical significance. In order of magnitude these were: function scores, frequency of use and current peer use. The contribution made by current peer use to the four equations only reached statistical significance for alcohol (β=0.170, p<0.05*)*.

Figures 4.2 to 4.5 summarise the results from the two sets of regressions for each of the four drug types. Each diagram consists of both of the dependent variables (current frequency of use and future use expectations) with paths showing the beta weights for the key predictor variables in the regression analyses (peer use, functions and negative effects). The significance level for each beta weight is indicated using asterisks. Age and gender are not included in the diagrams, but were controlled for in all the equations.



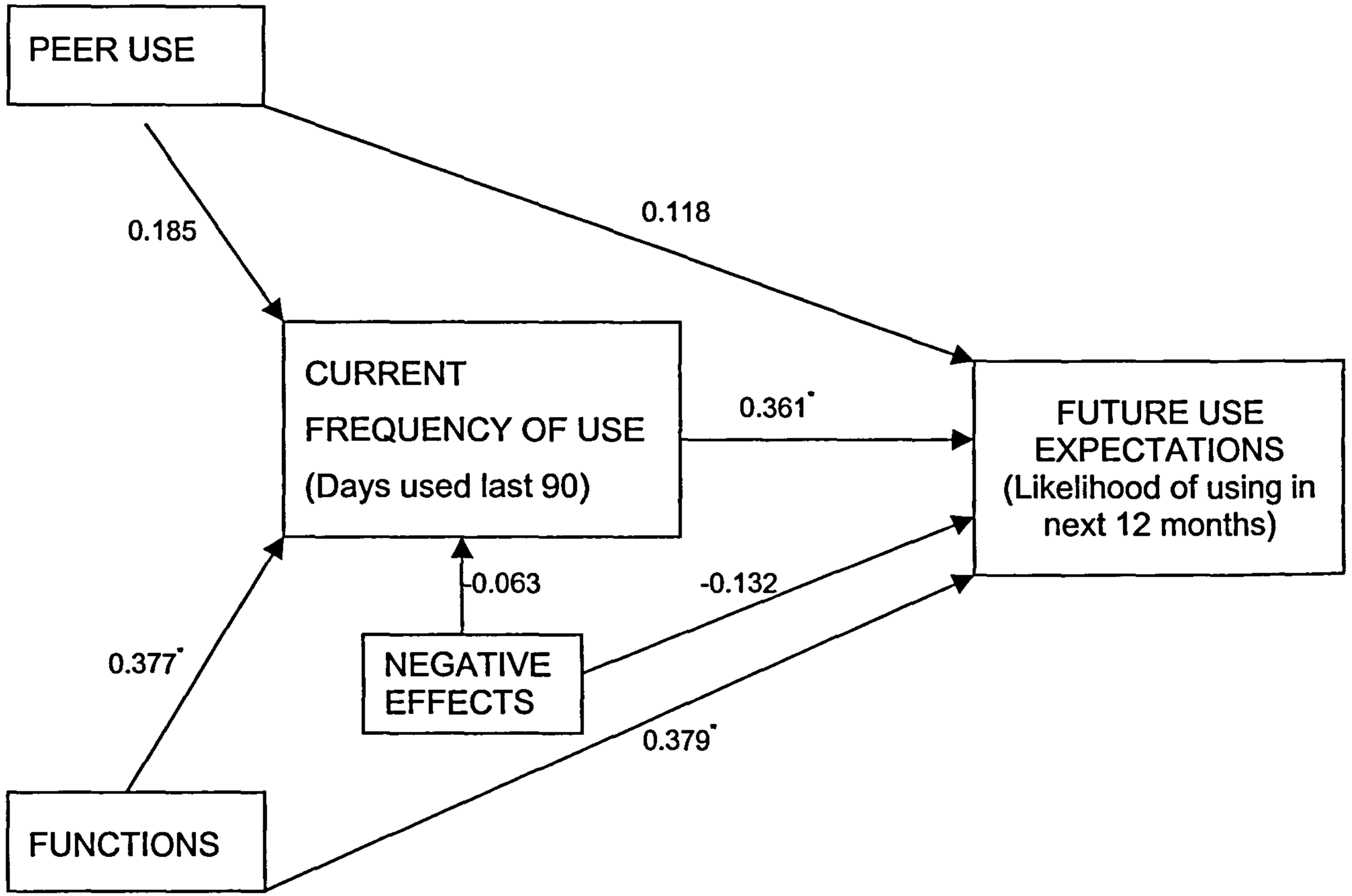
** Note: all paths controlled for age and gender* *$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$*

Figure 4.2 Path diagram summarising relationship between main variables and current frequency of alcohol use and future use expectations (n=99)



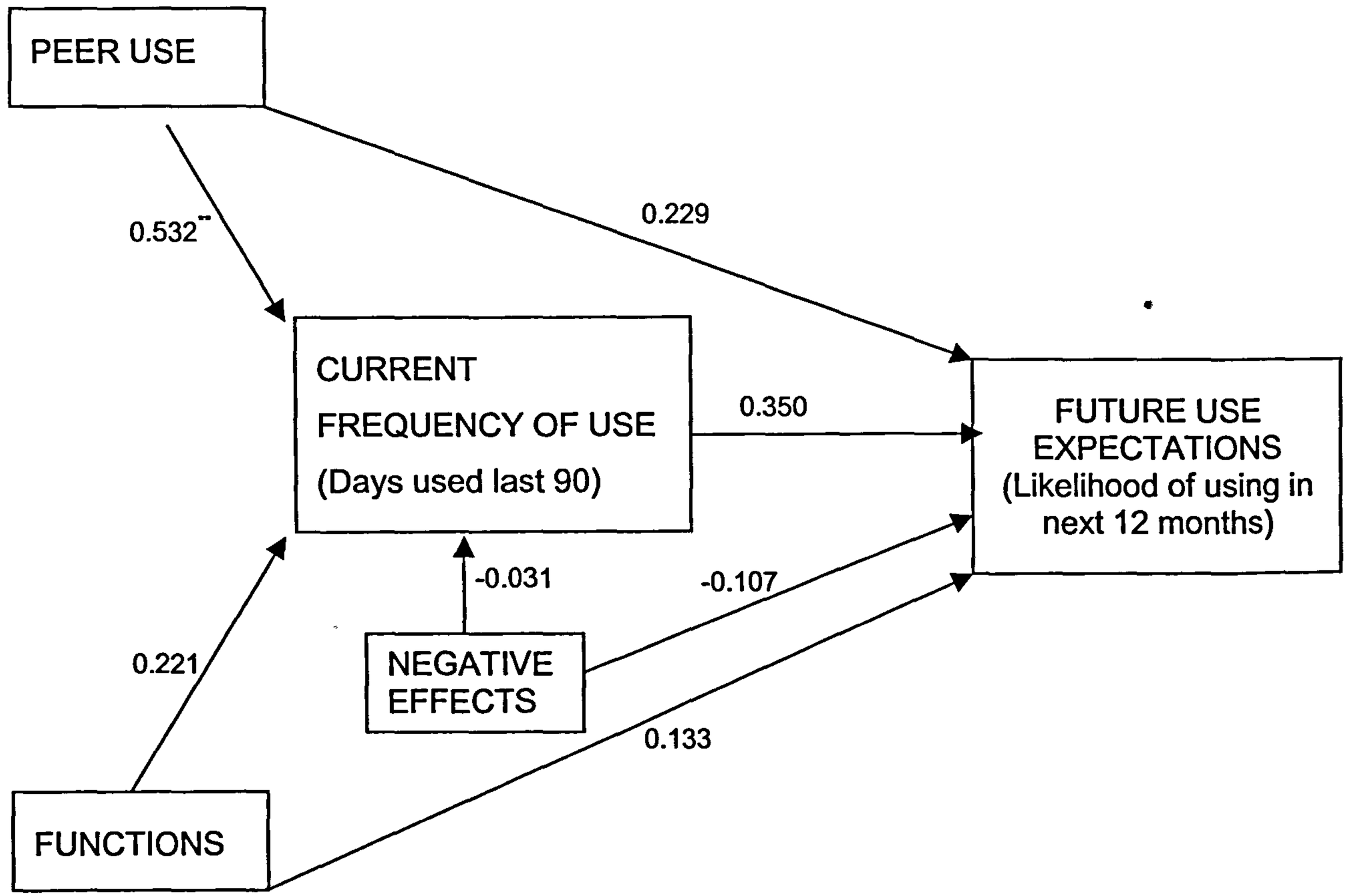
* *Note: all paths controlled for age and gender* $^{*}p < 0.05; ^{**}p < 0.01; ^{***}p < 0.001$

Figure 4.3 Path diagram summarising relationship between main variables and current frequency of cannabis use and future use expectations (n=80)



* *Note: all paths controlled for age and gender* $^{*}p < 0.05; ^{**}p < 0.01; ^{***}p < 0.001$

Figure 4.4 Path diagram summarising relationship between main variables and current frequency of amphetamine use and future use expectations (n=33)



** Note: all paths controlled for age and gender* *$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$*

Figure 4.5 Path diagram summarising relationship between main variables and current frequency of ecstasy use and future use expectations (n=28)

4.4 Discussion

This section discusses the major findings from the analyses presented in section 4.3. The main part of the discussion is structured around the four study hypotheses proposed in section 4.2. Following this, the analyses by age and gender are addressed. The remainder of chapter considers some general points regarding the analyses presented. This is followed by a discussion of some limitations of the research approach used. Finally, the chapter closes with a short summary.

4.4.1 Hypotheses

In this section, each hypothesis is re-stated and then discussed. Where the hypothesis exists in several parts, each part is discussed separately before general comments are made.

Hypothesis 1

There will be a strong positive relationship between current patterns of substance use and future use.

Frequency of use and future use expectations were highly correlated for all drugs, thus providing support for Hypothesis 1. Current behaviour has been widely acknowledged to be the strongest predictor of future behaviour and evidence exists in the literature to support this relationship for substance use (e.g. Bachman et al., 1984; Newcomb & Bentler, 1986). The results from the current study are therefore in line with previous studies that have examined this issue.

Although correlations were strong, overall, an average of just under a third (31%) of the variance in future expectation scores was accounted for by current frequency of use. This leaves almost 70% of the variance to be explained, suggesting that other factors are important in determining how likely an individual believes it is that they will use a particular drug again in the future. These factors were examined in the regression analyses in which future expectations was the dependent variable.

In summary, the relationships observed in the data were consistent with hypothesis 1: more frequent substance use was associated with stronger expectations regarding future use across the target drugs.

Hypothesis 2

The greater the extent to which users recognise functions for their use of a particular substance, (a) the greater the current frequency of use and (b) the stronger the expectations that use of the substance will continue in the future.

Hypothesis 2 suggests that scores on the functions scales will be positively correlated with measures of (a) current frequency of use and (b) future use expectations. Significant positive correlations were observed between scores on the functions scales and these variables for all four drugs, thus providing support for these predictions. For example, function scores for amphetamine use in the past year explained 18% of the variance in frequency of use and 13% of future expectation scores for this drug.

These relationships were also examined in the regression analyses, which provided further support for hypothesis 2. Function scores played a significant role in the models for current frequency of use and future use expectations for each of the target drugs, with the exception of ecstasy. Although the beta weights in the regression equations failed to reach statistical significance for ecstasy, they were not minor, but needed to be somewhat higher to reach significance with a sample of this size. This issue will be examined more closely in Chapter Five with data from a larger number of ecstasy users. Overall, the findings from this study support the idea that reported functions for substance use may be useful in helping to explain drug-related behaviours. Study Three will provide the opportunity for these relationships to be analysed more closely using a larger sample of young people and incorporating additional domains into the functions scales.

In summary, Hypothesis 2 was supported by the data analyses: higher function scores were positively associated with frequency of substance use and future use expectations.

Hypothesis 3

An individual's substance use will be positively associated with the substance use of peers.

Hypothesis 3 predicted that peer substance use would be positively correlated with current substance use and future substance use expectations. Correlations in this direction were observed between lifetime peer use and current peer use and these variables for all four drugs, thus supporting this hypothesis. Virtually all of these correlations reached statistical significance. Similarly, the hypothesis suggests that measures of peer substance use would be significant positive predictors in multivariate models of current frequency of use and future expectations. Again, the results from this study provided support for this prediction: peer use made a significant contribution to regression equations for current frequency of use for all drugs, with the exception of amphetamines. Here, the beta weight was still positive and relatively substantial, but did not reach statistical significance. This could indicate that the relationship between an individual's use and their peer use of amphetamines is weaker than for the other drugs tested. However, it should be noted that the number of amphetamine users in the equation was small (33) and consequently the equation may have been sensitive to outliers that prevented this variable from reaching statistical significance. The relationship between individual use and peer use of amphetamines will be examined in more detail in Study Three. Overall, the findings support the idea that there is a close relationship between the substance use of a young person and that of their peer group, although suggestions concerning the causal direction of this association can not be made on the basis of the current dataset.

Despite being significantly correlated with future expectations for all four drugs, perceived peer use only contributed significantly to the equation predicting future alcohol use. The results therefore suggest that a relationship exists between future alcohol use expectations and perceptions of peer alcohol use, but that the relationship between these variables for cannabis, amphetamines and ecstasy is much weaker. This could reflect the prominent position that alcohol use plays in many of the social activities engaged in by young people in our society. Although cannabis consumption can also be a social activity, the illegality of the drug means that use is generally

restricted to the privacy of people's homes and is perhaps less pervasive throughout all activities shared with peers than alcohol use. Furthermore, the actual process of using amphetamines and ecstasy is less sociable than using alcohol or cannabis. Although use of these drugs is likely to be associated with peer group activities such as clubbing, it is perhaps easier for different individuals within a group to share the same social activities while having different use profiles than in the case of alcohol. However, it should be noted once again that the sample size was relatively small. Consequently, any firm conclusions should be avoided at this stage. Study Three examines the relationship between peer and individual use more closely.

One problem with research in this area is that individuals vary in the language that they use to describe the relationship they have with 'friends' or 'peers' and so it is difficult to devise items to measure these relationships consistently. Additionally, the shape and structure of peer groups is likely to vary between individuals over time. For the purposes of the current study, the interviewer instructed respondents to answer the peer items by considering the people with whom they regularly (defined as at least once a month) spent time. Data from Study One suggested that patterns of substance use may be more closely related to that of close friends or 'best friends' than the wider peer group. This is consistent with other studies in the literature (Braucht, 1980; Windle & Barnes, 1988; Urberg, 1992). If so, it is likely that the phrasing of the questions used in the current study would have prevented this relationship from being observed in the analyses. These relationships are explored further in Study Three (see Chapter Five) in which measures to assess the substance use of a respondent's partner or best friend are also included.

Overall, the analyses generally supported Hypothesis 3. Positive associations between peer use and substance-use measures were observed for all drugs.

Hypothesis 4

Experience of negative effects from the use of a substance will result in the user (a) using the substance less frequently and (b) reporting weaker expectations that they will use the substance again in the future.

This hypothesis suggested that scores on the negative effects scales would be negatively correlated with measures of current frequency of use and future expectations for each of the target drugs. However, little support for this was found in the study. Although most of these correlations were found to be in the predicted direction, none of them reached statistical significance. Consequently, the possibility that the findings were due to chance could not be discounted.

The hypothesis also predicted that scores on the negative effects scales would be significant negative predictors in regression models of current frequency of use and future use expectations. However, scores on these scales did not contribute significantly to any of the regression equations in the analyses. Although negative in all cases (and thus in the predicted direction), the beta weights were also very small, suggesting that any influence exerted by these variables was minimal.

These findings could call into question the extent to which the experience of negative consequences from substance use directly influenced subsequent drug-related behaviours. As mentioned in Chapter One (see section 1.7.4), to date, a common approach in drug prevention has been to highlight the potential negative effects from use. However, for the current sample, correlations between lifetime experience of negative effects and the frequency of substance use were low. These findings could indicate that for this sample of young people, negative effects arising from substance use had not been sufficient to discourage future consumption. This interpretation is also consistent with findings from Study One that suggested users respond to the experience of negative effects in association with substance use in three different ways: i) by accepting the negative effects as an occupational hazard; ii) by moderating use to avoid future negative effects; or iii) by abstaining from further use after such an experience.

Furthermore, it should be noted that since the Study Two questionnaire recorded lifetime prevalence of negative effects, it is possible that those reported had been experienced some time ago. In such cases, use might have been modified immediately

after these experiences in order to avoid similar consequences in the future. If such modifications had resulted in abstention from the drug for more than a year prior to interview, the individual would have been excluded from the regression equation (due to the time frames used for the other variables). Negative effects are also likely to vary in severity and salience – neither of which were measured in the current study. Another possible explanation is that the items selected for use in this scale did not accurately reflect the extent to which negative effects had been experienced in association with the use of a drug, or the full range of possible adverse consequences. All three items were clearly appropriate for alcohol users (between 89% and 94% endorsed each one), but less widely endorsed by users of the other drugs, particularly amphetamines (between 43% and 50% of users). Due to their different pharmacological effects, it was very difficult to find a set of items that would generalise across all drug types examined in the study. However, to have items that differ for each substance was thought to be too complex an approach. Consequently, in Study Three, the scale will be modified in an attempt to rectify some of these perceived weaknesses. For example, in addition to measuring lifetime prevalence of negative effects, negative effects experienced during the 12 months prior to interview will also be assessed. This will make the time frames consistent with those for the functions scale.

In summary, overall there was limited evidence to support Hypothesis 4. There was no evidence for consistent negative relationships between negative effects scores and use and future use expectations of the drugs.

4.4.2 Gender and age differences

Very few gender differences were observed in measures of substance use in the dataset. Those that reached statistical significance were generally weak, reaching the $p<0.05$ level only. One exception was the finding that males reported consuming more cannabis on a typical using occasion than females. This, coupled with the findings that males reported more frequent recent cannabis use than females and indicated stronger expectations for future use, could indicate a general propensity for males to prefer the effects of cannabis than their female counterparts. In contrast, females were more likely to report recent use of amphetamines and stronger expectations that they would use this drug in the future. This could indicate a greater preference for the effects associated

with amphetamines among females. Qualitative data from Study One provided additional support for these findings interpretations.

Age differences were also relatively rare in the data, except for on several cannabis function items. Cannabis smokers who reported using the drug *" to increase confidence"*, *"to lose inhibitions"*, *"to decrease boredom"*, or *"to enjoy company"*, were significantly younger than those who did not endorse those items. This could indicate a tendency for the primary purposes for cannabis use to change as a user grows older. The main study in this thesis will offer the opportunity to examine this issue more closely.

4.4.3 Correlations

The reported bivariate correlations indicated an overall consistency between the four substances assessed. Relationships between current peer use and the behavioural variables were generally strong, but less so than for the function scores (with the exception of ecstasy). Overall, the correlations suggested that scores on the functions scale were likely to be stronger predictors of patterns of drug use and future expectations than peer use. It seemed unlikely that negative effects scores would contribute strongly to these measures. These inferences were supported by the regression analyses as discussed below.

4.4.4 Modelling substance use

The first set of regression analyses modelled current frequency of use for the four drugs using age, gender, function scores, negative effects scores and extent of peer use as covariates. The only variable to play a significant part in the models for all four drugs was the extent of peer substance use. However, the most striking finding was that for all drugs (except ecstasy), the function scores accounted for a greater proportion of the variance in frequency of use than was accounted for by peer use. For example, 28.4% of the variance in frequency of alcohol use was attributed to function scores for this substance compared with just 5.2% which was accounted for by peer alcohol use. As suspected from the low-order correlations, negative effect scores did not make significant contributions to any of the four regression equations. In short, these findings suggest that the frequency with which a young person uses a drug may be understood

primarily in terms of the extent to which use fulfils a range of functions for them. These findings are consistent with reports in the literature that more frequent users of a substance will report more numerous 'reasons' for their use (Mulford & Miller, 1960; Jung, 1977; Beckman & Bardsley, 1981; Carman et al., 1983; Glynn et al., 1983; Ratliff & Burkhart, 1984; Hesselbrock et al., 1987; Pang et al., 1989; Goodwin, 1990; Plant et al., 1990; Foxcroft & Lowe, 1993; Smith et al., 1993; Graham et al., 1996; Cronin, 1997; Bradizza et al., 1997; Williams & Clark, 1998). The extent of peer drug use also contributed to the models, but seemed to be much less important. However, the results provided little support for the hypothesis that the experience of negative effects from the use of a drug will result in less frequent use.

The second set of regression analyses modelled future drug use expectations. The regressions showed a notable amount of consistency across the different substance types (although the regression equation for ecstasy did not reach statistical significance). Measures of current frequency of substance use were strong predictors of future use expectations. This finding is consistent with previous studies that have suggested past behaviour is a strong predictor of future behaviour (e.g. Bentler & Speckhart, 1979; Bachman et al., 1984; Newcomb & Bentler, 1986; Mullen et al., 1987; Godin et al., 1993; Sutton, 1994; Norman & Smith, 1995; Newcomb, 1995). However, the results of the regression analyses indicated that future use expectations may also be understood in terms of the functions served by use. Scores on the functions scales accounted for between 10.7% (for cannabis) and 14.4% (for amphetamines) of the variance in future expectations for each drug. This indicates a strong relationship between the extent to which users reported functional use of a drug and expectations regarding future use. Users who reported more frequent and more varied recent functional drug use were more likely to indicate that their use would continue in the future. This relationship will be examined more closely in Chapter Five.

The regression equation for ecstasy did not reach statistical significance, although the beta weights for frequency of use, peer use and functions ranged between 0.133 and 0.350, suggesting that these variables were associated with the DV in a similar way to in the models for the three other drugs. It is possible that the low number of cases available for modelling future ecstasy-related expectations might have

prevented a significant result from being obtained. Once again, this will be investigated further with the main dataset (see Chapter Five).

4.3.5 Scale development

A key objective of this study was to examine the feasibility of developing two scales to measure functions and negative effects associated with use, using the same items for substances with very different effects. Cronbach's alpha coefficients indicated that the nine-item functions scale had good internal reliability for alcohol, cannabis, ecstasy and amphetamine use (LSD was omitted from analyses due to the small number of users in the dataset). These findings give some preliminary support to the idea that there are similarities in the types of functions which the use of different substances fulfil and that these can be measured using this type of scale. The next step is to expand the items in the scale to include functions from the different domains in Study One.

Cronbach's alpha coefficients for the three-item negative effects scales ranged from 0.60 (cannabis) to 0.88 (amphetamines), averaging 0.75 across the four drugs. These figures suggest that while the three-item scale had good internal reliability for alcohol, amphetamines and ecstasy, the items did not work so well as a scale for cannabis. This could be explained by the poor correlation observed between two of the items (*"felt sick or unwell"* and *"used more than would have like to"*) for cannabis users. The finding that excluding five outlying cases improved the scale reliability supports this conjecture. As with the functions scale, the main study will provide an opportunity to develop the negative effects scale items further and to examine the performance of the items with a larger sample.

4.4.6 Limitations of the study

In interpreting the findings from this study, it is important to consider a number of methodological issues. Firstly, the sample used was not randomly generated. The primary reason for deciding against a random sample was that the numbers required to test the study hypotheses would have been considerable given current population estimates for the prevalence of substance use within the 16-to-22-year age band (e.g. Ramsay & Spiller, 1997; HEA/BRMB, 1997). The snowball sample provided an economical means of testing the proposed measurement and analytical methods but

does not support the generalisation of results to the wider population of 16-22 year old substance users.

Secondly, the measures used relied on self-report. While this was unavoidable for some variables (such as the functions for substance use items), verification of other measures, such as frequency of use using biological or collateral interviews with peers could have been employed. Various strategies were used to try to minimise the likelihood of respondents deliberately providing inaccurate responses. For example, participants were reassured of the confidentiality and anonymity of the study. The issue of using self-reported data was discussed at length in Chapter Two (see section 2.5.5) and, overall, a review of the literature led to the conclusion that this was an acceptable method to employ in this piece of research. However, the possibility that the data may have been affected by this method remains. Study Three will provide the opportunity to ascertain if the relationships between variables can be replicated.

Thirdly, the demand characteristics of the interview situation should be considered (see section 2.6.1). Efforts were made to ensure that participants were relaxed in the company of the interviewer at the start of the session and an informal interviewing style was adopted. The interviewer did not express any opinions about the questions, subject matter or process, and responded neutrally to the answers given. The fact that participation was entirely voluntary and that the interview could be terminated at any point was also clearly stated to all participants. It was hoped that these strategies would reduce the likelihood that interviewees would answer questions according to what they thought the interviewer expected (or wanted) to hear. Although a self-completion rather than face-to-face interview format would have avoided this limitation, it would have compromised the level of detail of the data that could be collected.

All interviews conducted with young people for this study were carried out by the author. This approach ensured that the research protocol was adhered to and that the data collection process was consistent across all interviews. However, a limitation of this approach is that subconscious interviewer expectation effects may have influenced the data, as she was not blind to the hypotheses. In Study Three this issue will be addressed by using a different approach. A number of interviewers who are not involved in other aspects of the study will be trained to collect the data. A second potential limitation of this method was that the author was aware that the age gap between herself

and the youngest participants was such that she might be perceived as an adult, and therefore as an authority figure. While this did not appear to pose significant problems, as the young people seemed happy to be interviewed, this could have affected the way in which participants responded to the questions. For this reason, the findings would be more robust if supported by additional data from self-completion questionnaires or from interviews conducted by peer interviewers. This latter approach to data collection is tested in the next study, described in Chapter Five.

A final limitation concerns the content of the questionnaire. During the instrument design stage it was judged necessary to make the decision to include certain substances in the questionnaire and to exclude others. This judgement was based on data from population studies that indicated cannabis, amphetamines, ecstasy and LSD were the illicit drugs most commonly used by young people in the UK. However, during the course of the data collection many interviewees expressed surprise that cocaine hydrochloride (powder cocaine) was not included in the questionnaire, as they regarded its use as more common than LSD among their peers. Study Three therefore focuses on six main psychoactive substances (cocaine hydrochloride was added to the existing list of five target substances). This will provide the opportunity to examine whether 'functions' can also help to explain frequency and expectations regarding cocaine use.

4.5 Chapter summary

This study aimed to profile the patterns of use of five psychoactive substances in a sample of 16-22 year olds. It also explored the feasibility of using the results from Study One to develop reliable scales to measure functions and negative effects and to use these scales to examine relationships between individual and peer substance involvement and future expectations. The results provide tentative evidence that the development of scales to measure functions for the use of different substances is promising and that such scales may prove to be useful in helping to explain patterns of substance use and the expectations that young people have concerning future drug use. However, the results pertaining to the relationship between negative effects and patterns of substance use were less clear, although this could have resulted from a poor choice of recall period for items in this scale.

The next study (Study Three) provided the opportunity to test the approach to modelling patterns of substance use used in the current study on a much larger sample. The two scales were further developed to incorporate extra items based on the findings from Study One. In addition to this, the recall period for the negative effects scale was altered to the past 12 months. The models also included extra variables to allow more complex interactions between variables to be tested. Finally, the approach was extended to include a measure of substance-related problems as an additional dependent variable.

CHAPTER 5: MODELLING CONSUMPTION PATTERNS, PROBLEMS AND EXPECTATIONS IN YOUNG POLYSUBSTANCE USERS

5.1 Introduction

This chapter describes the third study in the research programme which modelled drug consumption patterns, problems and future use expectations. Its design and execution were informed by the findings from the initial qualitative and quantitative studies (reported in Chapters Three and Four). A key aim of the previous studies was to identify and inform the design and parameters of quantitative measures for the main study and to test the proposed analytical approach. The current study further developed and refined key measures identified in these earlier studies. Quantitative measures were then used to model patterns of substance use, problems and future use expectations using analytical methods similar to those tested in Study Two. The sample size in the present study was increased to allow more complex regression analyses to be conducted using a larger number of predictor variables than was previously possible. Methods used to gather the data were also modified to enable a larger sample to be accessed and interviewed within the available resources. Peer interviewing techniques were adopted to facilitate this process.

The main aim of this third study was to develop three sets of models to predict patterns of use, problems and future use expectations for six different substances (the five used in Study Two, plus cocaine hydrochloride). Findings from Study Two suggested that functions for substance use could be measured using the same items across different drug types and that this type of measure showed acceptable internal reliability. The resulting composite function scores were related to other variables in a systematic fashion that was consistent with the available literature. In this third study, the functions scale was extended further to include additional domains and items identified from the qualitative data in Study One. The internal structure and reliability of the resulting scale were then examined before testing the utility of these measures in multivariate models of behaviour. In particular, the utility of using functions to explain problematic substance use was examined.

The second scale developed in Study Two aimed to measure negative effects associated with substance use using the same set of items across different drug types. The

resulting three-item scale was shown to have acceptable internal reliability for all drugs. However, the analyses did not find support for the hypothesis that negative effects would be negatively associated with frequency of use and future use expectations at the bivariate or multivariate level. One possible reason for this finding was that the recall period for the scale was too wide (lifetime) to allow a relationship between these variables to be detected. It was therefore decided that the past year would be used as an additional recall period in the current study. The negative effects scale was also extended to include additional items identified in Study One.

The remainder of this chapter details the methods and findings from this main study and then discusses these in relation to the literature. First of all, the study hypotheses are described together with the rationale behind their development.

5.1.1 Study hypotheses

This section presents an overview of the background literature that informed the construction of the main hypotheses tested. Much of this work has already been discussed in detail in Chapters One and Four, so is only briefly described here. As noted previously, the literature on functions for substance use is extremely sparse. Consequently the literature on reasons and motivations for substance use has been drawn upon heavily for reasons explained in Chapter One. In particular, many of the studies cited have focused on use of alcohol rather than illicit drugs.

Studies have demonstrated a positive relationship between the number of reasons or motivations reported for drug and alcohol use and consumption patterns (e.g. Carman, 1979; Carman et al., 1983; Glynn et al., 1983; Johnson & O'Malley, 1986; Hesselbrock et al., 1987; Newcomb et al., 1988; Plant et al., 1990; Goodwin, 1990; Smith et al., 1993; Foxcroft & Lowe, 1993; Bradizza et al., 1997; Cronin, 1997; Williams & Clark, 1998; Simons, 2000). Similar findings were reported from Study Two in which positive correlations were found between total function scores for alcohol, cannabis, amphetamine and ecstasy, and frequency of recent use. Typical amount used was also significantly correlated with the extent of functional use for cannabis and alcohol. In the multivariate analyses, total function scores were significant predictors in the regression models for frequency of use for three drugs: alcohol, cannabis and amphetamines. These findings coupled with the background literature led to the prediction that heavier users of the target drugs would report more numerous functions for their substance use in addition to more frequent functional use.

Subscales designed to measure specific types of reason have also been shown to predict alcohol consumption. For example, Ratliff & Burkhart (1984) found that heavy drinking college students reported more 'social' and 'escapist' reasons for alcohol use than their lighter drinking peers. Similarly, Simons and colleagues (2000) noted significant correlations between alcohol consumption and 'enhancement' and 'social' motives for alcohol use. Different types of reasons for consumption have also been shown to predict drug use. Novacek and colleagues (1991) noted an association between using drugs for 'pleasure' or 'to cope' and frequent drug use, while less frequent users tended to report using 'to belong', 'to become more creative' or for 'aggressive' purposes. The present study examines the relationship between different types of functions for substance use and patterns of consumption.

The literature also provides evidence for a link between motives for alcohol use and problems relating to its use (Connors et al., 1990; Klein, 1992; Simons et al., 2000). Studies using non-clinical samples have reported an association between drinking alcohol to cope with negative mood states and alcohol-related problems (e.g. Glynn et al., 1983; Thombs & Beck, 1994). These findings suggest that alcohol-related problems are not simply explained by consumption patterns, but are linked to motivations for drinking. For example, Carey and Correia (1997) demonstrated that motives for alcohol use predicted alcohol-related problems in a sample of college undergraduates and that this relationship was only partially mediated by consumption levels. Although less numerous, studies have also noted similar findings regarding drug use. Carman (1979) reported a significant association between the number of motivations for drug use endorsed and problematic outcomes associated with substance use in a sample of rural junior high-school students. This study also noted that specific types of motivations for drug use were related to problematic use. The function items used in the current study will be analysed to assess whether or not they support the extraction of separate subscales. If so, the relationship between such subscales and problem scores will be examined in detail.

There is evidence that reasons for alcohol use differ between male and female drinkers (e.g. Ratliff & Burkhart, 1984; Orford & Keddie, 1985; Carman & Holmgren, 1986; Klein 1992; Dunne et al., 1993; Billingham et al., 1993; Beck et al., 1995). Foxcroft and Lowe (1993) reported that young females were more inclined to drink alcohol 'to feel more confident' than male drinkers. In another study, male 12-17 year olds were found to report more 'social pressure' reasons for drinking (Windle & Barnes, 1988). Similarly, gender differences have been noted in reasons cited for drug use

(Newcomb et al., 1988; Novacek et al., 1991). Newcomb et al. (1988) reported that males tended to use cannabis to enhance positive affect and creativity in contrast to female respondents who were more likely to use this drug to reduce negative affect. Similarly, a study by Novacek and colleagues found that females reported more 'coping' reasons for drug use while male respondents endorsed more 'pleasure' reasons (1991). It is also likely that reasons or motivations for drug use differ according to the age of the individual (Murry & Perry, 1984). For example, Newcomb et al. (1988) noted that older teenagers were more likely to report using drugs to reduce negative affect than younger teenagers. Similarly Novacek and colleagues (1991) found that high-school students endorsed more coping and pleasure reasons for drug use, while middle school students tended to report more belonging and creativity reasons for use. Given this background literature, the current study tested the data for age and gender differences in the function items.

Other influences on patterns of substance use examined in the current study include peer substance use and aspects of drug careers such as age of first use or 'onset'. As discussed in Chapter One (section 1.7.1), having substance using peers has consistently been found to be one of the strongest predictors of substance use among young people (Kandel et al., 1978, 1986; Jessor et al., 1980; Elliott et al., 1985; Barnes & Welte, 1986; Kandel & Andrews, 1987; Brook et al., 1990). The importance of the peer group in determining patterns of substance use was discussed in detail in Study One. Similarly, positive correlations between peer use and recent frequency of alcohol, cannabis, amphetamine and ecstasy use were observed in Study Two. Peer use predicted frequency of use in the regression analyses for each of these drugs except amphetamines.

There is also evidence in the literature for high correlations between alcohol consumption patterns in 'best friends', particularly in young females (Windle & Barnes, 1988). Once again, evidence to support these findings was noted in Study One, together with indications that the substance use of a current 'partner' may also influence an individual's consumption. Consequently, in addition to the peer measures used in Study Two, the current study included measures of 'best friend' (or 'partner') substance use to test relative associations with the key dependent variables.

A link between initiating drug and alcohol use at a young age and subsequent negative outcomes has been widely discussed (e.g. Rachal et al., 1982; Kandel, 1982; Robins & Przybeck, 1985; Fergusson et al., 1994; Fergusson & Horwood, 1997). A study by Fleming et al. (1982) found early involvement predicted greater frequency of substance use. Some studies have reported that later age of initiation to drug use is

associated with less extensive drug involvement and a higher probability that use will cease (Kandel et al., 1976). The current study introduced age of first use as a predictor variable to examine its relationship with problem scores for each of the target drugs.

In summary, eight hypotheses were developed based on the above literature and the results from the study described in Chapter Four. These are detailed below:

Hypothesis 1

There will be a positive relationship between function measures (total function score and subscale scores) and measures of current use (frequency of use and typical amount used and intensity of use).

Hypothesis 2

Perceived extent of current peer substance use (particularly that of a best friend or partner) will be strongly related to measures of consumption, although these variables will not exert as powerful an effect as functions.

Hypothesis 3

There will be a positive relationship between problem scores and a) measures of current use (frequency and typical amount) and b) function measures.

Hypothesis 4

Function scores (and particularly negative mood functions) will predict problems after controlling for consumption levels.

Hypothesis 5

Age of first use will be negatively correlated with a) current use and b) problem scores for each of the target drugs.

Hypothesis 6

There will be a strong positive relationship between future expectations and a) current patterns of use, b) overall functions for use, c) current peer use and d) partner/best friend's use.

Hypothesis 7

Function scores will predict future expectations after controlling for consumption levels and peer use.

Hypothesis 8

Negative effects will be associated with (a) using the substance less frequently, (b) higher scores on the problems scales and (c) weaker expectations regarding future use.

5.1.2 Peer interviewers

Unlike the first two studies described in this thesis, Study Three used peer interviewers to collect data. This section summarises the background literature to this approach and discusses some of the issues considered during the study design and data collection phases.

The use of key informants (or 'gatekeepers') to facilitate non-probability sampling has been widely used in social research, particularly for drug use research (e.g. Becker, 1963; Fielding, 1981; Adler, 1985; Fountain, 1992; Moore, 1993; Fountain et al., 1998). Some researchers have also used 'ex' or current drug users to collect data from hidden populations of drug users referring to such individuals as "Privileged Access Interviewers (PAIs)" (Griffiths et al., 1993) or "Indigenous Interviewers" (Power, 1994; Brain et al., 2001). This method of data collection has proved effective in generating large samples from hidden populations that would be difficult to access using alternative methods (Griffiths, 1998). A major advantage of this approach is that large samples sharing key characteristics can be generated quickly and within limited resources (Griffiths et al., 1993, Griffiths, 1998). In addition to facilitating contact with potential respondents, the process of recruiting them into the study can be facilitated as it is considered more likely that they will trust assurances of confidentiality given by somebody familiar, who they perceive as similar to themselves (Griffiths, 1998). It is also likely that interviewees will feel more relaxed being interviewed by someone who they know (and regard as a 'peer'), rather than an unknown researcher. Reilly & Homel (1987) reported that young people responded better when interviewed by young people from similar subcultures to themselves. It has also been noted that using research workers with personal experience of drug use may increase data accuracy as they are readily able to recognise and challenge inconsistent or improbable answers (Power, 1994). Limitations of this approach cited in the literature include the need to have stringent data monitoring strategies, a high level of

continued support and training for the interviewers and highly structured, clearly presented research instrumentation. It is important to acknowledge variability in interview style between interviewers as well as demand characteristics (as discussed earlier, see section 2.6.1). Finally, as with any non-probability approach to sampling it is important to be cautious when applying study finding to the wider population (Griffiths, 1998).

Prevalence data (see section 1.6.1), suggests that the majority of young people growing up in the UK will have experience of substance use (be it licit or illicit) by the time they reach young adulthood (HEA/BRMB, 1997; Ramsay & Spiller, 1997; Ramsay & Partridge, 1999, Parker et al., 1995, 1998; Balding, 1997, 2000). Consequently, although research that samples young substance users draws from populations which are 'hidden' to a certain extent, these behaviours are not as rare as the drug injecting studied by Griffiths and colleagues, or Power. Their terminology therefore seemed inappropriate for the research described in this thesis. Recent years have seen an increase in the popularity of using young people to work with other young people in a health education context. This model is often referred to as 'peer education', although what exactly constitutes a 'peer' is often unclear. In general, a 'peer' seems to be an individual who is perceived as being of equal status with the target group (rather than necessarily of equal age). For example, the interviewers used to gather data from 11-18 year olds by Best & Barrie (1997) are referred to as 'peer researchers' despite being aged between 20 and 23 years. The preferred term for the current thesis is therefore 'peer interviewer' as people were not recruited solely because they were drug users or ex-users, but because they knew people who fitted the study criteria.

Power has published detailed discussions of methodological, ethical and practical issues pertaining to the use of indigenous (or peer) interviewers in research with drug users (Power, 1994, 1995). He has suggested that the majority of problems can be avoided if interviewers are carefully recruited, trained and supervised. He advocated that practical and clear fieldwork guidelines should be compiled at the start of a study and given to all interviewers before commencing work. The importance of conducting routine checks on the data collected to ensure it is valid and reliable is also highlighted. Ideally, a combination of different checks should be implemented throughout the data collection process. Similar recommendations were made by Griffiths and colleagues (1993). Although both Griffiths and Power refer to studies in which adult interviewers were employed to target hidden populations of drug injectors, in the absence of any literature

specifically on using young peer interviewers, their general guidelines were used to help to inform the current study.

5.2 Method

The design was a cross-sectional survey. Data were collected between July and November 1998 via structured interviews administered by trained peer interviewers. Interviews were audiotaped to facilitate quality control procedures. This section describes the methods used to recruit and train the interviewers and to collect and analyse the data.

5.2.1 Participants

A total of 364 young illicit drug users participated in the study[1]. Inclusion criteria were devised to ensure that levels of substance use in the sample would be sufficiently high to allow the study hypotheses to be adequately addressed in the analyses. Respondents were eligible for interview if they:

- were between 16 and 22 years old
- had used at least two illicit drugs in the past three months on more than five separate occasions in total
- had not received treatment for a drug or alcohol-related problem.

A purposive structured 'snowball' recruitment strategy was chosen as the most appropriate means of accessing this hidden population. Peer interviewers were trained to recruit and interview their drug-using friends and acquaintances. In this way each peer interviewer acted as a starting point for the snowball sample.

5.2.2 Instruments

Three separate instruments were used to gather data in this study. These are detailed below (copies of all instruments used can be found in Appendix K).

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[1] *These data have been analysed separately and published elsewhere: Boys, A., Marsden, J., Griffiths, P., and Strang, J., (2000b). Drug use functions predict cocaine-related problems. Drug and Alcohol Review, 19, 181-190; Boys, A., Marsden, J., Griffiths., (1999c). Reading between the lines: is cocaine becoming the stimulant of choice for urban youth? Druglink, 14 (1), 20-23 and Boys, A., Marsden, J., and Strang, J., (2001b). Understanding reasons for drug use: a functional perspective. Health Education Research. In press. (see appendix Q).*

i) *Interviewer monitoring form* – this gathered basic data on each of the interviewers including demographics and education level (see section 5.2.4.2).

ii) *Main questionnaire* – this formed the basis of the research interview with the study participants (see section 5.2.2.1).

iii) *Interview record sheet* – this was designed to be completed by the interviewer at the end of each interview and recorded data on the location of the interview, its duration and the nature of any problems encountered (see section 5.2.4.8).

In the following section, the procedure followed to develop the main questionnaire is described.

5.2.2.1 Developing the main questionnaire

The research instrumentation combined items and scales tested during earlier stages of the research programme with new material. As in Study Two, the five psychoactive substances which prevalence research in the UK has shown to be most widely used among the target age group were selected for inclusion in the main body of the questionnaire. A sixth drug (cocaine hydrochloride – referred to as 'cocaine' hereafter) was also included as feedback from interviewees in Studies One and Two, together with informal discussions with experts working with young people, suggested that use of this drug was gaining popularity within the sample age group. The instrument also recorded use of other drug types thus enabling these assumptions concerning patterns of use to be examined.

5.2.2.2 Selection of scale measures

Given the age range of the sample population it was necessary to review scales that had been previously used for research with both adolescents and adults. It was desirable to keep the research instrument as concise as possible (to avoid interviewee fatigue), while still covering salient areas identified in the earlier studies. It was therefore vital that items could be completed quickly and had good validity and reliability. In addition to using

existing, established measures, several items and scales were specifically developed for the questionnaire. Questions covered the following seven domains:

- Demographics
- Substance-use history
- Current patterns of substance use (past 90 days)
- Functions for substance use
- Negative effects
- Future use expectations
- Perceived peer substance use

The next section provides an overview of the measures used in each of these domains and describes how the scale items were selected and developed.

5.2.2.3 Structure of the questionnaire

As peer interviewers were responsible for the data collection, considerable time was invested in designing the main questionnaire to ensure that it was 'user friendly'. This section describes the structure and content of the questionnaire.

Page 1: Eligibility check

A flow chart on the first page of the questionnaire was designed to verify the eligibility of a respondent for interview. It was made up of three questions corresponding to the inclusion and exclusion criteria described in section 5.2.1 together with possible answers (see appendix L).

Page 2: Interview pre-amble

The interviewers were instructed to adhere to the wording provided to introduce the study at the start of the interview. The following main points were addressed in this text (see appendix M for wording in full):

- Purpose of the study
- Aims of the study
- Confidentiality

- Interview process
- Reason for audio-taping the interview
- Request for consent for participation in the study

Section A: First section of the questionnaire

The first section of the questionnaire was designed to gather demographic and background information from respondents. Participants were invited to provide demographic information, details about their current living arrangements, their educational history and their financial details. The following measures were used:

Demographics: i.e. gender; age; ethnic group (tick-box options based on the ten-category Ethnic Group classification used in 1991 Census output – Dale & Marsh, 1993), current occupation.

Current living arrangements: i.e. type of current accommodation; who respondent was living with.

Educational history: i.e. age when left school; personal rating of school performance compared to peers on a scale of 1 to 7 (where 1=very poorly and 7=very well); school exclusion (yes/no); highest qualification obtained to date.

Financial details: i.e. monthly income; monthly disposable income (defined as any money that was spare after paying for rent, bills and food). Responses were requested for a 'typical month'.

Sections B to G of the questionnaire

These six sections focused on profiling substance use and were all structured similarly. They were designed to collect matching data sets on the six target substances (cannabis, amphetamines, ecstasy, LSD, cocaine and alcohol). Questions in each section were numbered identically to facilitate cross-referencing and to minimise confusion. Thus question B3 asked for the age of first cannabis use, C3 for the age of first amphetamine use and so on.

Three different recall periods were used: the respondent's whole lifetime, the past 12 months and the past 90 days. These time periods were chosen to enable the extent of a respondent's experience with a drug to be described in detail, while facilitating the omission of irrelevant questions (for example, if a respondent indicated that they had not used a substance in the past 12 months, questions regarding use during the past 90 days were automatically omitted). The questions used in these six sections are detailed below.

Substance-use history: Each section started with questions about first use and frequency of lifetime use. First of all, respondents were asked if they had 'ever' used a particular substance and if so, their age at the time of first use. The total number of occasions of lifetime use were then assessed by asking participants to choose one of a list of categories from a prompt card. The category options were as follows: once only, 2-10 times, 11-20 times, 21-50 times, 51-100 times and more than 100 times. Users were also asked to indicate the way in which they had most often consumed the drug during the past year (swallow, snort/sniff, smoke/chase, inject).

Current substance use: Current patterns of use were then mapped in detail. As in Study Two (see Chapter Four), 'current' use was defined as use within the 90 days prior to interview. Consumption patterns were assessed using measures of frequency and typical quantity as described in Chapter Three (see section 3.2.3.1) with one minor difference. In the previous study, the usual quantity of cannabis use was recorded as the number of 'joints' smoked in a typical using day. In this study, the quantity of cannabis was recorded in grams.[1] This allowed greater measurement precision and was particularly appropriate as this measure was used as a dependent variable in multivariate analyses. Respondents were asked to estimate their usual amount in grams and if this was problematic, the number of joints was recorded and then converted to grams at the data entry stage.

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[1] This calculation used an estimate of one joint being approximately equal to 0.27g. This conversion was based on figures used for the Bethlem & Maudsley NHS Trust Community Drug Team's database.

Adverse consequences from substance use: Questions 7-13 were concerned with measuring substance-related problems. When the instrument was developed, there were no existing validated screening questionnaires developed for use with adolescent substance users in the UK. Alternatives developed elsewhere were considered, but judged to be unsuitable for two reasons: either because of length (e.g. The Drug Use Screening Instrument (DUSI) comprises 149 items – Kirisci et al., 1995) and/or because all drugs are combined together in one category (e.g. The Substance Misuse in Adolescence Questionnaire (SMAQ), Swadi, 1997). Instead, seven measures were selected from a pool of items derived from two diagnostic systems (The World Health Organisation's International Classification of Diseases ICD-10 and the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (see appendix A). As discussed in Chapter One (see section 1.4.2), it is has been noted that for most common drugs, few young people show symptoms of dependence in the form of tolerance or withdrawal (Segal & Stewart, 1996; Segal, 1990, 1996). Consequently, items relating solely to dependence were omitted as they were judged to be inappropriate for a sample of non-treatment young drug users. Instead a set of measures was selected to assess the incidence of early signs of problematic substance use. The items used are summarised in table 5.1. The 12 months prior to interview was chosen as the recall period for these items.

Table 5.1 Substance-related problem items

1. Have you been pre-occupied by thoughts about using [drug]?
2. Have you been worried or concerned about your [drug] use?
3. Has your [drug] use led to problems with family, friends, work etc.?
4. Has your use of [drug] led you to neglect what was normally expected of you?
5. Have you regretted what you did when you were high or intoxicated on [drug]?
6. Have you used more [drug] than you intended to?
7. Have you prioritised spending money on [drug] over other things?

Negative effects: To complement the problem measures, four items pertaining to negative effects experienced from substance use based on those developed in Study Two were included in the questionnaire. One of the three items used in Study Two (*"Taken more/a stronger dose than you would have liked to when using [drug]?"*) was very similar to one of the problem items developed from ICD-10 and DSM-IV described above (*"Have you*

used more [drug] than you intended to?") and was therefore dropped from this scale. Instead an extra two items were added based on the findings reported from Study One. These items were *"had an accident or taken an unnecessary risk as a result of using"* and *"felt anxious or nervous as a result of using"*. Each item had two parts: first of all the respondent was asked if they had ever experienced the particular negative effect. Those who responded positively were then invited to rate the frequency with which they had experienced it over the 12 months prior to interview using a five-point Likert-type scale ('never', 'rarely', 'sometimes', 'often', 'always', coded 0-4). A prompt card showing these options was used to facilitate responses.

Functions: The nine-item function scale used in Study Two (see Chapter Four) was extended to include an additional nine functions that related to the other three domains identified in Study One (i. using for specific physical effects, ii. using to facilitate an activity and iii. using to manage the effects of other substances). Although three functions fitting into the latter category were identified in Chapter Three, only two items were included in the questionnaire. This was because two functions (*"using to enhance the effects of another drug"* and *"to manage the side effects of another drug"*) were combined into one item (*"using to improve the effects of another drug"*) that would capture use for both purposes. Two items were judged to be inappropriate for use in questions for all six drugs (using "*to help sleep*" and "*to help lose weight*"), but still seemed important functions that should not be omitted altogether. It was therefore decided that these two items would used interchangeably: questions pertaining to cannabis and alcohol use included the first item and those pertaining to the stimulant drugs used the second item instead. Neither item appeared relevant to LSD use and so both were omitted from this section. The final questionnaire contained a total of 18 functional statements that spanned all five domains identified in Chapter Three (see appendix N for items in full). After piloting, one item from the scales used in Study Two (using *"to feel closer to someone"*) appeared to be too ambiguous and was therefore modified (to using *"to enhance feelings when having sex"*). This was re-piloted and was reported to be clearer. The response format used was the same as for the negative effect items: the respondent was first asked if they had ever used the drug in order to fulfil the particular function. Those who endorsed the item, were then invited to rate how frequently they had used for this purpose over the past 12 months on a five-point Likert-type scale ('never', 'rarely', 'sometimes', 'often', 'always', coded 0-4).

Future substance use: The six drugs sections of the questionnaire (B to G) closed with a measure addressing future substance use. Expectations concerning future use of each of the target substances were measured in a similar way to Study Two, using items based on those used by Warshaw and Davis (1985). Respondents were asked to rate the likelihood that they would use the target substance within the next 12 months on a scale of 1 to 7 (where 1= 'definitely not' and 7= 'definitely will'). A prompt card illustrating this scale was used to facilitate responses.

Section H of the questionnaire

Section H was designed to measure use of substances additional to the six addressed in sections B to G. Respondents were asked if they had ever smoked a cigarette and if so, to indicate the average number that they had smoked on a typical day in the past 90 days. They were then asked which of the following substances they had ever used: heroin, nitrites, solvents, gases, fuels, crack cocaine and non-prescribed tranquillisers. Finally, in an open ended question, there was the opportunity to name up to four additional substances that they had ever used.

Perceived peer substance use: Perceived peer substance use was measured using similar items to those used in the Study Two questionnaire (see Chapter Four). First of all, respondents were asked to estimate the proportion of their friends who had ever used each of the six target substances using a five-point scale ('none', 'a few', 'about half', 'most', 'all' – coded 0-4) These options were shown on a prompt card. 'Friends' were defined as people with whom they regularly spent time. They were then asked to estimate the proportion that they thought would use each of these substances again within the next 12 months using the same scale. This time period differed from that used in the previous study (which was six months) to make it compatible with responses to the future expectations items at the end of sections B-G. Additional questions, using a similar format, were included to measure the perceived substance use of the respondent's partner (or best friend if they had no current partner). Here, a yes/no response was requested for each item.

5.2.3 Piloting of the main research instrument

The questionnaire was piloted in three phases. First of all, interviews were role-played with students in the university department to assess the completion time of the instrument and the flow of the questions. At the end of each of these role-played interviews, the mock interviewee was invited to comment on the structure and clarity of each section of the questionnaire. Second, after minor revisions and corrections, the questionnaire was piloted with five young drug users who met the inclusion criteria. They were invited to give feedback in a similar way at the end of the interview. Finally, a peer interviewer was inducted into the study and trained to use the questionnaire. They subsequently piloted the questionnaire with five more young substance users in the community. This process was designed to ensure two things: first, that the questionnaire had no major comprehension or structural problems and second, that the process of training a peer interviewer to use the instrument was viable. Average completion time for these pilot interviews was approximately one hour. As these ten pilot interviews were generally consistent with subsequent interviews, they were included in the final dataset.

5.2.4 Data collection process

Data were collected via face-to-face interviews conducted by peer interviewers. The advantages and limitations of using face-to-face interviews versus self-completion questionnaires have been discussed in Chapter Two (section 2.6.1). This section aims to describe features of the data collection process that were unique to this study. Methods and processes that were common across all three studies were described in Chapter Two.

In order to be eligible for interview, recruits were required to meet certain criteria pertaining to their substance use. Consequently, they had already disclosed details of their drug and alcohol use before the interviews actually commenced. Nevertheless, considerable effort was invested in trying to control factors that might inhibit accurate reporting under such conditions (see Chapter Two for a more detailed discussion of these factors). In particular, the anonymous and confidential nature of the study was emphasised to participants; the interviews were conducted in informal locations and by people already known to them or their peers. As far as possible, all interviews were conducted in private or where they could not be overheard. On occasions when others were present, it was at the specific request of the respondent. None of the interviews conducted during the course of this research was in the presence of a parent or similar authority figure. Finally, at the start of the interview, the purpose of the research was

carefully explained and the respondent was strongly encouraged to refuse to answer a question rather than give an inaccurate answer.

5.2.4.1 Peer interviewers

A team of peer interviewers was recruited to gather the data for this study. This method of data collection had two main advantages:

i) It provided a quick method of recruiting and interviewing a large number of young people within the study time and resource constraints.

ii) It was thought that face-to-face interviews conducted by people already known to the interviewees would be less threatening (and consequently the data collected would be more accurate) than interviews conducted by a stranger.

<u>Recruitment of peer interviewers</u>

The peer interviewers were recruited through adverts in universities and on public notice boards, and by word of mouth. Two eligibility criteria based on those used by Griffiths et al. (1993) were used to select potential applicants:

i) They had to be able to access at least ten people from their peer group who fitted the eligibility criteria for inclusion in the study.

ii) They had to be equipped with the social and educational skills required to conduct interviews according to the study protocol.

These criteria were assessed through initial telephone conversations and a brief face-to-face interview with each applicant. Potential interviewers were excluded from the team if it was thought that conducting the interviews might be damaging to them in some way or that they had certain personal characteristics or attributes that might make them seem threatening to potential respondents. Only one applicant was rejected for the above reasons: a mature student who forcefully voiced very negative views about drug use.

Interviewer recruitment spanned four out of the five months during which data collection took place. In total, 20 interviewers were recruited during this period: ten at the start of the data collection phase (July 1998), an additional five two months later, and the remaining five as the original recruits began to stop interviewing. It was initially envisaged that a further ten would be required (operating on the assumption that each

would conduct approximately ten interviews) to reach the target sample size. However, this proved unnecessary as several recruits interviewed well over this projected figure.

5.2.4.2 Interviewer characteristics

Each interviewer completed a brief, anonymous monitoring form. The characteristics of the interviewing team are summarised below.

The average age of the 20 interviewers was 23 years (median=22, mode=22, range 18-26). Fourteen (70%) described their ethnic origin as 'white European', three were 'black' (15%) and three 'Asian' (15%). Forty percent (8) were in full-time education, just under a third (6, 30%) had part-time work, three (15%) were in full-time employment and two (10%) were unemployed at the time of training.

Half of the interviewers reported that they had left school at age 16 or under, three (15%) at age 17 and the remainder at 18 years. All the interviewers had at least one formal qualification. The highest qualification for three of the interviewers was at GCSE level, a further five had GNVQ3/BTEC qualifications and four had A-levels. The remaining eight had attained diploma or degree-level qualifications.

5.2.4.3 Interviewer training

All interviewers underwent a one-day training course on interviewing skills and using the questionnaire. Each person received an interview manual developed specifically for the study. The manual provided a written reference source to consolidate material covered in the training sessions. It contained information on the following topics:

- Background to the study
- Recruitment protocol
- Confidentiality
- Interview protocol
- Interviewing techniques
- Interviewer responsibilities
- Detail on questionnaire sections
- Notes clarifying potentially problematic questions
- List of contact organisations (should further information or help be requested by any of the interviewees).

The training was conducted by the author in groups of between four and eight people. A variety of methods were used: lecture, group discussion, group exercises and role-play. An informal approach to training was employed to try to ensure that participants were as relaxed as possible and felt able to ask questions throughout the sessions. At the end of the training day, the interviewers were asked to complete an anonymous feedback form to enable subsequent sessions to be revised and improved. For example, after the first training day three interviewers reported that they would have preferred to spend more time role-playing interviews. Consequently, an extra half an hour was allocated to this activity in subsequent sessions. Interviewers were also encouraged to contact the author if any further questions concerning the study arose after the initial training.

5.2.4.4 Drop out

To a certain extent the interviewers were self-selecting – a few felt that after attending the training day the demands of the study would be too great, or that accessing suitable respondents would be too difficult for them. Two who attended the initial training day dropped out of the study before conducting any interviews. Both were male second-year university students who decided that they had alternative priorities for their time.

5.2.4.5 Management issues

To ensure that the data collected was of a high standard, the interviewers were closely monitored and managed. Measures to facilitate this included asking each interviewer to sign a contract acknowledging that they agreed to the following:

(a) to recruit and interview at least ten eligible young people;
(b) to follow the recruitment protocol and tape-record each interview, including verbal consent from the respondent;
(c) to ensure that the interview was conducted following confidentiality procedures and assurances as described in the study protocol;
(d) to ensure that data from the interview was recorded on the questionnaire accurately;
(e) to ensure that completed questionnaires and tapes are stored securely;
(f) to attend regular debriefing sessions with the project manager to discuss interview data and comply with study data quality control protocol.

After completing the training, each interviewer received a tape-recorder, spare batteries, a set of prompt cards and five questionnaire packs. The questionnaire packs contained a blank tape, a questionnaire and an interview record sheet. Each interviewer was asked to conduct five interviews before returning to the research centre. If any problems arose before the five questionnaires had been completed, they were encouraged to discuss these with the researcher either on the telephone or at a face-to-face meeting at their convenience. On returning to the research centre with the completed questionnaires, the interviewers were debriefed and the manuscripts were carefully checked against the interview recordings. This process enabled the identification and correction of misunderstandings or completion errors. Any inconsistencies were highlighted and discussed with the interviewer and where necessary additional training was provided. Once an interviewer was judged to be conducting interviews to a satisfactory standard, they were offered ten interview packs to take away with them. Less competent individuals were restricted to five interview packs at a time.

The author telephoned each interviewer approximately once a week throughout the data collection period for a verbal progress update and to check that they had not encountered any significant problems. Regular letters were also sent out to the team to provide them with progress reports on the data collection.

5.2.4.6 Data verification

In addition to completing the questionnaire by hand, the interviewers were required to tape-record each interview. The rationale behind this process was to enable the researcher to check that the interview protocol had been followed and that the questionnaire had been completed accurately. It also provided a means of checking (and correcting) any inconsistencies or anomalies in the questionnaires before the data were coded for entry onto a computer.

5.2.4.7 Procedure

A total of 364 16-22 year olds were interviewed for the study. The age, gender and occupation of respondents were closely monitored throughout the data collection process to ensure an even spread of demographic characteristics across the sample. This process was designed to ensure that sufficient individuals were recruited to the groups to allow subgroup analyses by demographics. Two sampling matrices were designed to track the characteristics of the sample (age by gender and current occupation by gender). At the

end of each week, characteristics from all new interviews were entered into the matrix. If certain cells became unbalanced, the interviewers were instructed to target specific types of respondent (for example, females under 18) until the matrix became more balanced. This method proved to be very successful, (see appendix O for completed matrices).

5.2.4.8 Interview record sheets

At the end of each interview, the interviewers completed an 'interview record sheet'. This recorded basic information about the interview process, including how the respondent was recruited, where the interview took place and if there were any problems encountered during the interview (see appendix K3).

Each interviewer completed an average of 18 interviews (range 8-53). One interviewer did a relatively large proportion of the total number of interviews conducted (14.6% of total sample). There was some concern that the interviewers were generally of above average education, and therefore likely to access and interview peers of similar educational backgrounds rendering the sample overly representative of students. Given the aims and design of the study, this was not perceived to be a significant problem, as the sample was not intended to be representative of all young drug users within the target age range (see section 2.3.1). However, this particularly enthusiastic interviewer was encouraged to conduct a large number of interviews as she was accessing young people who were not students, and many of whom lacked any qualifications.

The majority of the interviews were conducted in a private home. This was usually the interviewer's home (105, 28.8%), or that of the respondent (90, 24.7%) or another friend (76, 20.9%). Interviews were also conducted in a pub or café (44, 12.1%), a park (13, 3.6%) or 'other' locations (such as at college, at work, in a car or in a hotel). Two thirds of the respondents were either friends of the interviewer (133, 36.5%), or friends of another interviewee (108, 29.7%). Just over a quarter of the sample were casually acquainted with the interviewer (98, 26.9%) and the remaining 25 interviewees were either related to the interviewer (16, 4.4%) or had responded to a poster advertising the study. One interviewer was eligible for inclusion in the study and so was able to complete a questionnaire herself.

The interviews took between 30 and 70 minutes to complete, with an average time of 42 minutes. In general, the interviewers found that the first five interviews that they conducted were the slowest, and as they became more familiar with the questionnaire and interview protocol, the time taken substantially decreased.

5.2.5 Data Preparation and validation

The statistical package SPSS/PC+ was employed for data entry and error checking. Two separate files were required to accommodate all the variables. These were then merged into one file and analysed using SPSS Windows version 8.0. The process of ensuring that the data files were accurate has been described in detail elsewhere (see Chapter Four). Similar processes were adopted to deal with missing data and outliers.

5.2.6 Data Analysis

Similar statistical tests to those described in Chapter Four were used to analyse the data. This section reviews the main bivariate and multivariate analytical procedures and inferential statistical tests employed, before reporting on the results from the study.

Chi-squared tests were used for the analysis of proportions. Scale-based and continuous measures were analysed using Pearson's correlation coefficients (*r*) (for bivariate comparisons), and *t*-tests for the comparison of two mean scores. As in Study Two, Cronbach's alpha coefficients were calculated to assess internal reliability of the scales used (see section 4.3.1.5 for explanation). In addition, principal components analysis (PCA) was also used to explore the factorial or dimensional structure of various scale-based measures. PCA isolates groups of items in a scale which are relatively independent of one another, and thereby allows the underlying structure of a scale to be identified (Stevens, 1996).

As in Study Two, a core analytic method was the use of multiple regression. In the analyses, both standard and sequential regression analyses were performed. In standard multiple regression, all of the predictors are entered into the analysis at once and each predictor is evaluated in terms of its contribution to the regression equation after the influence of all the other predictors has been judged. In sequential multiple regression, the predictors are entered into the equation in a specified order on the basis of logical and/or theoretical grounds. In this approach, the regression equation (or model) is constructed in steps.

In all tests reported in this chapter only results that were significant at the 0.05 level or below are reported. A general principle of reporting three significant figures was adopted.

Mediating and moderating effects

Regression analyses were also used to assess the data for mediating and moderating interactions between variables. The term 'mediation' is used to describe the action of a variable that can explain for the relationship between two other variables (or a significant part of it) (see section 1.6.2). For example, lung cancer can be described as mediating the relationship between smoking and premature death (i.e. cancer acting as the primary cause of death). In contrast, a 'moderator' affects the strength or direction of the relation between an independent and dependent variable. Specifically, Thus a moderator divides an independent variable into different subgroups with different effects on an outcome variable (Baron & Kenny, 1986). For example, the relationship between alcohol consumption and level of intoxication could be described as moderated by gender, as females tend to have a lower tolerance than males. In the current study, data were tested for mediation and moderation effects using procedures recommended by Baron and Kenny (1986). These are described below.

Figure 5.1 represents a mediation effect. To test if 'M' mediates the relationship between the independent variable 'IV' and the outcome variable 'OV', three relationships between these variables must be tested. First, the OV is regressed onto the IV to establish that the two variables are correlated (labelled as 'path a' in figure 5.1). Second, M is regressed onto the IV to show that these two variables are also correlated (path b). Finally, the last regression (path c) tests if the mediator affects the OV when the IV is also used as a predictor variable (i.e. OV is regressed onto IV and M). If M fully mediates the relationship between the IV and the OV, then in the third regression IV will have no significant effect on OV (i.e. path c will be close to zero). If the IV still predicts OV under these circumstances, but the strength of the association is substantially reduced in the third regression, then M is said to 'partially mediate' the relationship between IV and OV.

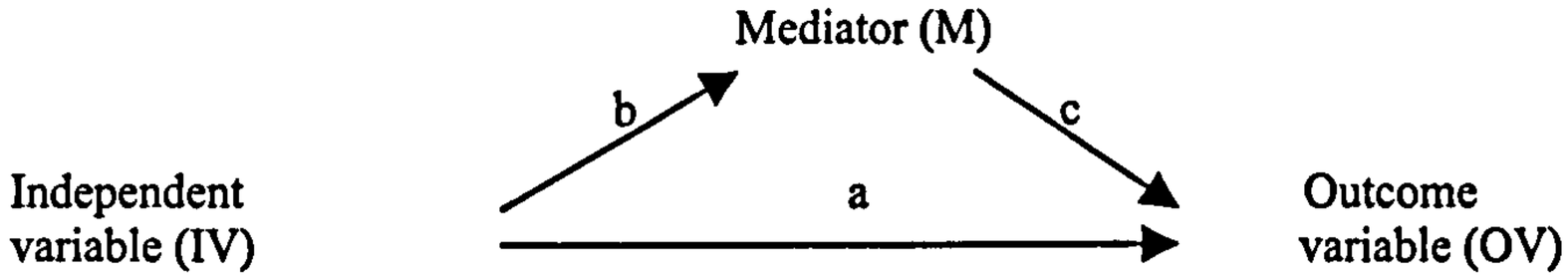


Figure 5.1 Mediation Effect

Figure 5.2 represents a moderation effect. To test whether M moderates the effect of the independent variable (IV) on an outcome variable (OV), the two terms are multiplied together to create a new variable or 'interaction term'. All three variables (IV, M and IVM) are then entered into a regression equation using OV as the dependent variable. If the interaction term IVM has a significant effect on the dependent variable in this equation (path z) when its constituent parts are controlled for, the moderation hypothesis is supported.

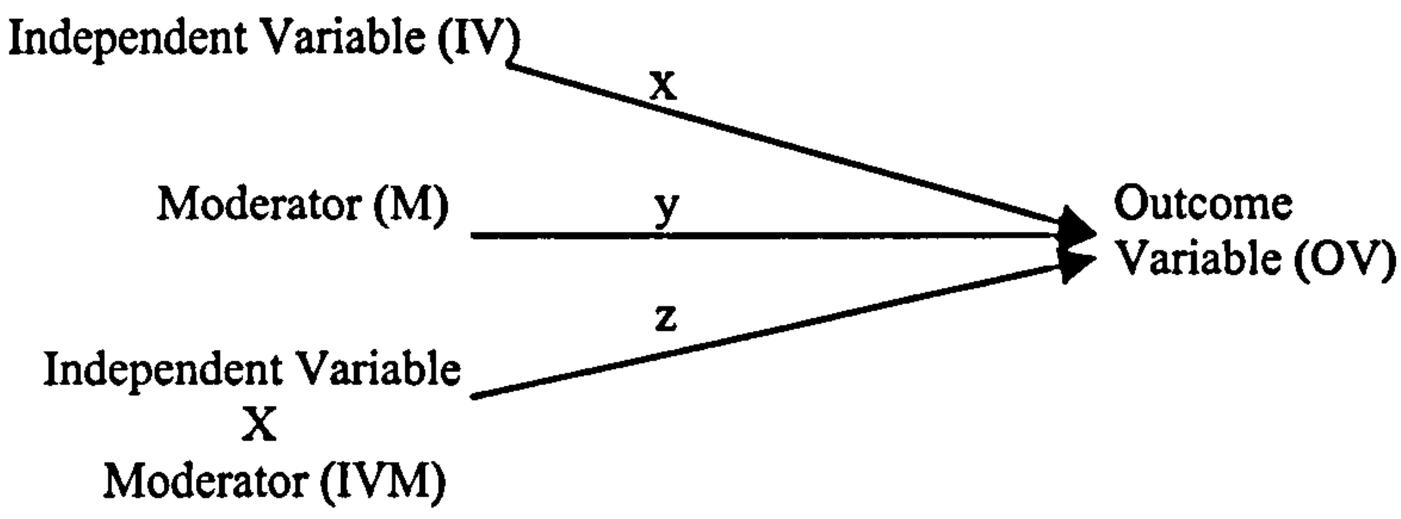


Figure 5.2 Moderation Effect

5.3 Results

5.3.1 Descriptive statistics

The following section summarises the descriptive statistics for the key variables from the dataset. First, the sample demographics are presented followed by data on patterns of substance use, functions for use, negative effects and peer substance use.

5.3.1.1 Demographics

The sample consisted of 364 young drug users between the ages of 16 and 22 years inclusive (56.3%, 205 males and 43.7%, 159 females). The mean age of the sample was 19.3 years (s.d.=1.9). A fifth of the sample (75; 20.6%) were under 18 years old. There were no significant age differences between male and female respondents (mean age for males = 19.4, mean age for females = 19.1, $t_{[362]}$=1.76, p=0.076 *n.s*).

<u>Occupation</u>

A third of the sample were in education, almost two fifths were working and just over a quarter were unemployed at the time of interview. The sample demographics are summarised in table 5.2. Chi squared tests revealed significant gender differences in occupation: female respondents were slightly more likely to be in some form of education, whereas males were more likely to have paid employment at the time of interview ($\chi^2_{[3]}$=14.76, p<0.01).

Table 5.2 Demographic characteristics of the study population (n=364)

Variable		*Males n=205 (%)*	*Females n=159 (%)*	*Total n=364 (%)*	
Age:					
	16-17	34 (16.6)	38 (23.9)	72 (19.8)	
	18-19	69 (33.7)	51 (32.1)	120 (33.0)	
	20-22	102 (49.8)	70 (44.0)	172 (47.3)	$\chi^2_{[2]}=3.11$, n.s
Ethnicity:					
	White European	140 (68.3)	114 (71.7)	254 (69.8)	
	Black	34 (16.6)	12 (7.5)	46 (12.6)	
	Asian	18 (8.8)	19 (11.9)	37 (10.1)	
	Other	13 (6.3)	14 (8.8)	27 (7.4)	$\chi^2_{[3]}=7.56$, n.s
Occupation:					
	Unemployed	62 (30.2)	38 (23.9)	100 (27.5)	
	In education	52 (25.3)	69 (43.4)	121 (33.2)	
	Employed	91 (44.4)	52 (32.7)	143 (39.3)	$\chi^2_{[2]}=14.76$, $p<0.01$
Current accommodation:					
	Parental home	87 (42.4)	66 (41.5)	153 (42.0)	
	Rented (private)	61 (29.8)	66 (41.5)	127 (34.9)	
	Council/housing association	19 (9.3)	15 (9.4)	34 (9.3)	
	Own flat/house	18 (8.8)	5 (3.1)	23 (6.3)	
	Hostel or NFA	15 (7.3)	5 (3.1)	20 (5.5)	
	No stability[1]	5 (2.4)	2 (1.3)	7 (1.9)	$\chi^2_{[5]}=11.22$, $p<0.05$
Monthly disposable income:					
	£0-100	46 (22.4)	41 (25.8)	87 (23.9)	
	£101-200	50 (24.4)	39 (24.5)	89 (24.5)	
	£201-400	56 (27.3)	53 (33.3)	109 (29.9)	
	£401-600	33 (16.1)	17 (10.7)	50 (13.7)	
	£600+	20 (9.8)	9 (5.7)	29 (8.0)	$\chi^2_{[4]}=5.29$, n.s.

[1]*These respondents reported that they were unable to choose one category as their accommodation arrangements varied.*

Living arrangements

At the time of interview, just over two fifths (42.0%) of the sample were living with their parent(s); approximately a third (34.9%) rented their accommodation, 34 (9.3%) were living in council or housing association homes and 23 (6.3%) owned their flat or house. Twenty of the young people interviewed (5.5%) were in hostels or of no fixed address and the remaining seven (1.9%) reported variable accommodation arrangements in which there was no general stability. Just over 10% of the sample shared their accommodation with their partner, a similar proportion were living alone and 18 people (4.9%) were living with their own children.

5.3.1.2 Education history

Leaving school

A fifth (72; 19.8%) of the sample had left school before they reached 16 years and a further 56.9% (207) had left school at the age of 16. There were no significant gender differences in the age of leaving school.

Educational qualifications

Almost a third of the sample (113; 31%) had studied to A-level standard or above, for half of the sample the highest qualification that they held was at GCSE level (181); and the remaining 17.0% (62) had no formal qualifications at the time of interview. It should be noted that due to the age range of the sample, some were too young to have progressed past GCSE level.

School performance

When asked to rate how well they did at school on a seven point scale (where 1='very poorly' and 7='very well'), female respondents tended to score themselves higher (mean score = 4.8) than males (mean score = 4.4) ($t_{[361]}$= -2.29, p<0.05).

School exclusion

Just over a third of the sample (125, 34.3%) reported a history of school exclusion (76 male and 49 female). No significant differences were observed by gender ($\chi^2_{[1]}$=1.64, p<0.05).

5.3.1.3 Substance use history

Table 5.3 summarises the lifetime prevalence, mean age of first use and past year prevalence of substance use among the sample. The drugs most widely used were cannabis (96.2%), amphetamines (51.6%), cocaine (50.5%) and ecstasy (48.6%).

Table 5.3 Lifetime prevalence, mean age of onset and past year prevalence for nine substances (n=364)

Substance	*Lifetime use (%)*	*Mean age of first use*	*Past year use (% ever)*
Cigarettes	301 (82.7)	-	-
Alcohol	327 (89.8)	13.1	312 (95.4)
Cannabis	350 (96.2)	14.4	345 (98.6)
Amphetamines	188 (51.6)	16.1	165 (87.8)
Ecstasy	177 (48.6)	16.5	166 (93.8)
LSD	91 (25.0)	16.2	61 (67.0)
Cocaine powder	184 (50.5)	17.0	172 (93.5)
Inhalants[1]	158 (43.4)	-	-
Benzodiazepines	80 (22.0)	-	-
Crack cocaine	93 (25.5)	-	-
Heroin	44 (12.1)	-	-
Hallucinogenic mushrooms	29 (8.0)	-	-

[1]category includes amyl/butyl nitrites, solvent, gases and fuels

- data not collected

There were no gender differences observed for lifetime use of any drug type with the exception of LSD. Here the prevalence was 31.2% for male respondents and 17.0% for females ($\chi^2_{[1]}=9.68, p<0.01$).

On average, respondents reported lifetime use of 6.1 different substances (range 2-14, median=5.0; mode=4.0, s.d.=2.6). As outlined in the methods section, detailed data were collected on the use of six target substances (alcohol, cannabis, amphetamines,

ecstasy, LSD and cocaine). The rest of this section focuses on the use of these substances.

Age of first use

On average, alcohol was the first substance to be used, closely followed by cannabis. The average age for initiation into use of the 'dance drugs' (ecstasy, amphetamines and LSD) was approximately 16 years of age and for cocaine it was 17 years. There were significant gender differences in age at first use for alcohol and cannabis only. In both cases females were significantly older than males at initiation (alcohol: 12.9 vs 13.4 years, $t_{[325]}$= -2.36, p<0.05; cannabis: 13.9 vs 14.4 years, $t_{[348]}$= -2.46, p<0.05 respectively).

Past year use

Respondents who reported amphetamine use within the year prior to interview tended to be younger than those who had not used within this period (19.5 years vs 20.6 years; $t_{[186]}$= -2.67, p<0.01). Similar age differences were observed among the lifetime LSD and cocaine users (19.4 years vs 20.3 years; $t_{[89]}$= -2.44, p<0.05; and 19.2 years vs 20.6 years; $t_{[182]}$= -2.39, p<0.05 respectively).

Total occasions of lifetime use

In order to measure lifetime experience, respondents were asked to estimate the total number of occasions on which they had used each substance. Most respondents who had used alcohol and cannabis had done so on more than 100 occasions. Table 5.4 summarises the responses given.

Table 5.4 Total number of occasions of lifetime use of the six target drugs (% of lifetime users)

Substance	*Once*	*2-10 times*	*11-20 times*	*21-50 times*	*51-100 times*	*Over 100 times*
Alcohol (n=327)	0	0.6	0.6	4.3	7.0	87.5
Cannabis (n=350)	0.3	0.6	0.9	9.4	10.0	78.9
Amphetamines (n=188)	5.3	15.4	15.4	27.1	22.3	14.4
Ecstasy (n=177)	7.3	15.8	13.0	26.6	10.2	27.1
LSD (n=91)	13.2	35.2	17.6	23.1	7.7	3.3
Cocaine (n=184)	3.8	23.4	18.5	23.4	14.1	16.8

It was most common to have used amphetamines and ecstasy between 21 and 50 times. Use of LSD was much more varied, with a significant proportion of users having only tried it once (13.2%) and two thirds having used it on 20 occasions or less. There were no significant gender differences in the total number of occasions of lifetime use for any of these drugs.

5.3.1.4 Current patterns of substance use

On average, respondents had used 3.2 out of the six target drugs during the 90 days prior to interview (median=3.0; mode=3.0; s.d.=0.77). There were no gender differences in the number of drugs used during this time period.

Table 5.5 summarises the prevalence of use of the six target substances during the 90 days prior to interview, the frequency (days used) and amount consumed on a typical using day. A series of chi-squared tests and *t*-tests were conducted to assess these data for gender and age differences on these variables. Significantly more females reported amphetamine use during the 90 days prior to interview (86.3% vs 74.1%; $\chi^2_{[1]}$=4.14, p<0.05). Out of the lifetime amphetamine users, those who had used this drug within the past three months were significantly younger than those who had not (19.4 vs 20.6 years; $t_{[74]}$=-4.644, p<0.001), as were recent LSD users (19.0 vs 20.4 years; $t_{[89]}$=-4.19, p<0.001) and recent cocaine users (19.1 vs 20.4 years; $t_{[182]}$=-3.28, p<0.001).

Table 5.5 Profile of substance use during past 90 days (n=364)

Substance	*% lifetime users who had used in past 90 days (n)*	*Mean days used in past 90 days (s.d.; range)*	*Average amount on typical using day (s.d.; range)*
Alcohol (n=327)	94.5 (309)	39.7 (26.5;1-90)	9.8 [c] (6.74; 0.5-42.0) [1]
Cannabis (n=350)	98.3 (344)	55.2 (33.7; 1-90)	1.9 [a] (1.49; 0.11-10.7) [2]
Amphetamines (n=188)	79.3 (149)	7.7 (8.5; 1-70)	0.9 [a] (0.54; 0.02-2.5)
Ecstasy (n=177)	87.6 (155)	9.0 (9.9; 1-51)	1.7 [b] (1.07; 0.5-5.0)
LSD (n=91)	50.5 (46)	5.3 (7.25; 1-39)	1.3 [b] (0.67; 0.5-4.0)
Cocaine (n=184)	85.3 (157)	11.3 (13.8; 1-80)	0.8 [a] (0.53; 0.01-3.5)

[a] = grams; [b] = No. of tablets; [c] = No. of units (1 unit = 8g ethanol approximately)

[1] Two alcohol users reported consuming 48.0 and 50.0 units of alcohol on a typical using day respectively. These outlying values were recoded to the next highest intensity recorded in the sample (42.0 units per day) to ensure a more representative measure of mean intensity.

[2] One respondent reported smoking 21.3g of cannabis on a typical using day. This outlying value was recoded to the next highest intensity recorded (10.65g).

There were few differences in the frequency of use and typical amount used of the six target substances: males reported drinking more frequently during the three months prior to interview (42.2 vs 35.6 days, $t_{[310]}= 2.23$, $p<0.05$) and that they used more cannabis on a 'typical using day' (2.0 grams vs 1.6 grams; $t_{[338]}= 3.35$, $p<0.001$).

Route of administration

Participants were asked to indicate the main route that they had used to consume each substance during the year preceding interview. Two of the cannabis users reported that they had mainly eaten it over the past year, the rest (338, 99.4%) had smoked the drug. The most common route of use for amphetamines was oral ingestion (101, 61.2%), followed by snorting (63, 38.2%) and then smoking (1, 0.6%). Female amphetamine users were significantly more likely to take this drug by oral ingestion than males, who were more likely to snort the drug ($\chi^2_{[1]}=4.64$, $p<0.05$). Ecstasy was ingested orally by virtually all users (163, 99.4%) with the exception of one (0.6%) who reported that they had mainly snorted it. LSD was orally ingested by all users. Finally, cocaine was mainly

snorted (157, 93.6%), although seven reported smoking (4.1%) and four that they had mainly ingested the drug orally (2.3%).

5.3.1.5 Future expectations

Future expectations regarding use of each of the target substances were measured on a seven point scale (1= 'definitely not' to 7= 'definitely will'). For ease of reporting, in the following table these responses have been collapsed into three groups: those who were unlikely to use again (scoring 1-3); those who were unsure (scoring 4) and those who were likely to use again (scoring 5-7).

Table 5.6 Expectations regarding use of target substances in the next 12 months (% of users)

	Alcohol (n=327)	*Cannabis (n=350)*	*Amphet. (n=188)*	*Ecstasy (n=177)*	*LSD (n=91)*	*Cocaine (n=184)*
Likely to use again (scores 5-7)	89.0%	94.3%	53.7%	72.3%	40.7%	68.5%
Unsure (score of 4)	2.4%	1.1%	11.2%	6.2%	7.7%	16.3%
Unlikely to use again (scores 1-3)	8.6%	4.6%	35.1%	21.5%	51.6%	15.2%
Mean score (median)	6.32 (7.0)	6.58 (7.0)	4.52 (5.0)	5.30 (6.0)	3.65 (3.0)	5.29 (6.0)

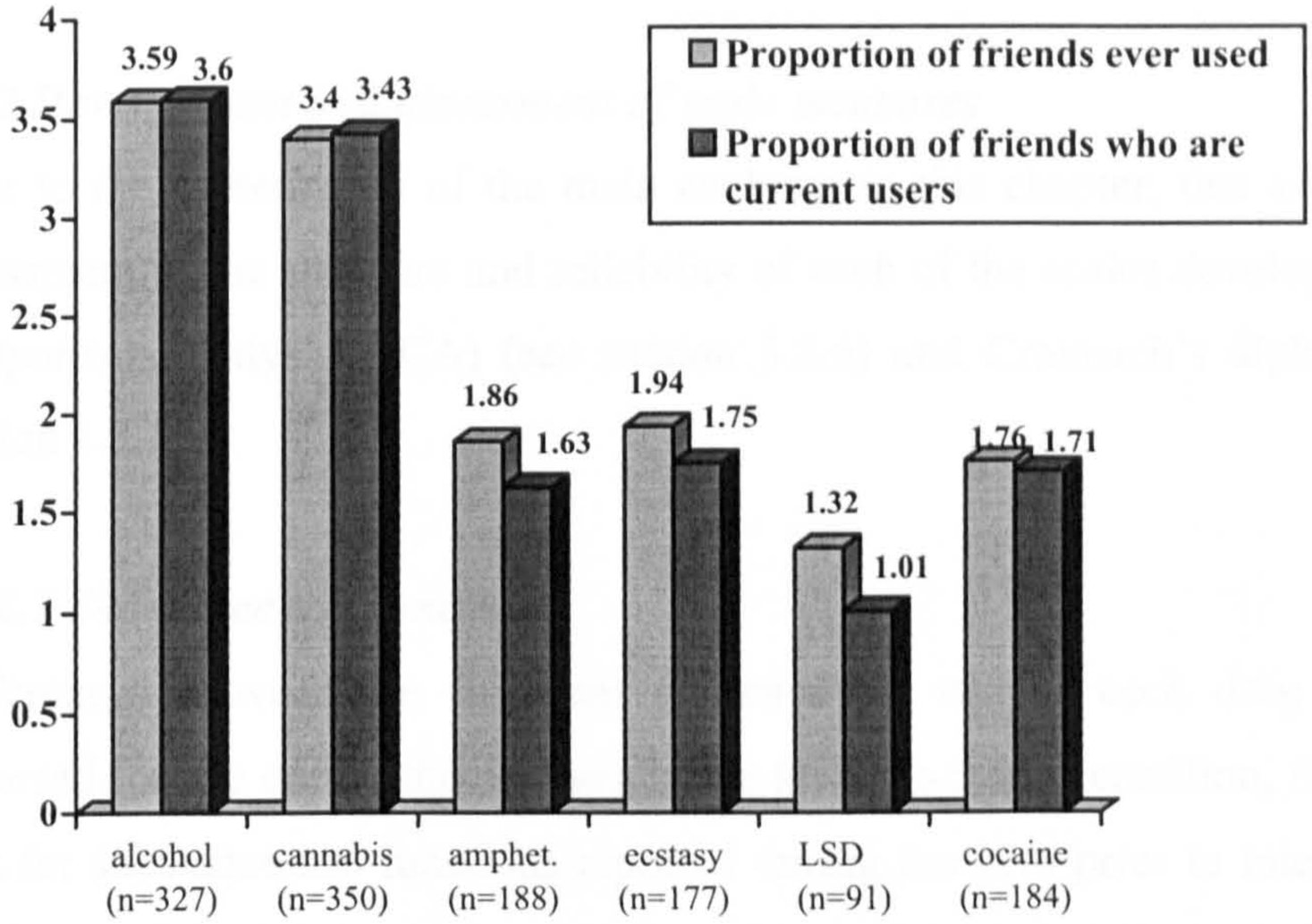
The majority of alcohol and cannabis users reported that it was very likely they would continue to use these substances in the next year. Consequently, there was little variance in scores on these variables. Many of the ecstasy users and cocaine users also thought it likely that they would use these drugs again in the next year. In contrast, those who had used LSD were most likely to report that they would not use this drug again in the next year, while amphetamine users were more divided. No gender or age differences in future expectation ratings were found for any of the substances profiled.

5.3.1.6 Peer substance use

Respondents were asked to characterise the drug use of their peers. The first item asked them to estimate the proportion of their friends who had ever used a particular substance ('none' to 'all', scored 0 to 4) and the second asked for the proportion that they thought would use it again within the next twelve months (as a indicator of perceived current peer

drug use). The mean scores for lifetime use of the six drugs for those who had ever used each of these, ranged from 1.32 (i.e. 'a few') for LSD to 3.59 (i.e. almost all) for alcohol; for perceived current use scores, ranged from 1.01 (for LSD) to 3.60 (for alcohol). Mean scores are illustrated in figure 5.3. There were no significant differences in scores by gender on any of these variables.

Figure 5.3 Perceived peer drug use for respondents who had ever used each drug



Best friend/partner

Just over half (204, 56.0%) of the sample reported that they had a current 'partner' at the time of interview. Respondents were asked to indicate whether or not their 'partner' (or, if they did not have a current partner, their 'best friend') had ever used each of the target drugs and if they thought that they would use them within the next 12 months. Table 5.7 summarises their responses:

Perceptions of partner/best friend's substance use closely mirrored individual patterns. Alcohol and cannabis had been used by virtually everyone's partner or best friend and almost everyone expected their current partner or best friend to continue to use these substances in the next year. Of particular note was the finding that only 41.5% reported that their partner/best friend had used LSD and less than half of these thought that they would use this drug again in the next year.

Table 5.7 Summary of perceived partner/best friend's substance use

Substance	*Ever used (%)*	*Use in next year*
Alcohol	347 (95.3%)	340 (93.4%)
Cannabis	345 (94.8%)	330 (90.7%)
Amphetamines	222 (61.0%)	156 (42.9%)
Ecstasy	228 (62.6%)	156 (42.9%)
LSD	151 (41.5%)	69 (19.0%)
Cocaine	209 (57.4%)	177 (48.6%)

5.3.2 Development and assessment of scale measures

Prior to the presentation of the main analyses in this chapter, this section describes the assessment of the structure and reliability of each of the scales developed using principal components analysis (PCA) (see section 5.2.6) and Cronbach's alpha coefficients (see section 4.3.1.5).

5.3.2.1 Substance use functions

Differences between the functions endorsed for use of each drug 'ever', and those endorsed for use during the past year were few. To avoid repetition, this section presents data for substance use functions reported during the year prior to interview only. Table 5.8 summarises the proportion of users who reported using for each function in the past year by drug. In general, the most commonly endorsed functions reflect the pharmacological effects of the drugs. For example, the stimulant drugs were commonly used to keep going or to stay awake while the drugs with depressant effects (cannabis and alcohol) were used by many to relax.

The table also shows means for the total number of different items endorsed by individual users (NUMFUN) and the mean total scores for all items (TOTFUN) (i.e. the sum of the frequency scores – 'never' to 'always', scored 0-4). For simplicity, the abbreviations given in brackets are used to refer to these variables throughout the rest of the chapter. There were no significant gender differences in the NUMFUN or the TOTFUN scores for any of the six substances, with one exception. Female cocaine users scored higher than their male counterparts on the TOTFUN measure for cocaine (female mean score=20.2, male mean score=17.1; $t_{[170]}$=-2.08, p<0.05). This indicates that, overall, female users reported more frequent functional cocaine use than male users.

Table 5.8 Proportion (%) who endorsed each functional statement for their use of the target substances in the past year

Used [substance] to ...	Alcohol (n=312)	Cannabis (n=345)	Amphet. (n=165)	Ecstasy (n=166)	LSD (n=61)	Cocaine (n=172)
Make yourself feel better when down or depressed *("to feel better")* [1]	69.9	69.0	43.1	48.4	20.7	61.9
Help you keep going on a night out with friends *("to keep going")*	66.7	35.9	95.6	91.1	58.6	84.5
Help you feel elated or euphoric *("to feel elated")*	51.3	46.1	60.6	77.7	72.4	57.1
Just get really stoned or intoxicated *("to get intoxicated")*	89.1	90.7	55.0	68.2	77.6	66.1
Help you enjoy the company of your friends *("to enjoy company")*	74.0	66.4	58.1	63.1	58.6	61.3
Help you to relax *("to relax")*	82.7	96.8	13.1	29.9	17.2	28.6
Help feel more confident or more able to talk to people in a social situation *("to increase confidence")*	70.2	36.5	53.1	42.0	10.3	66.1
Improve the effects of other substances *("to improve effects")*	41.0	44.3	37.5	27.4	29.3	26.2
Help ease the after effects of other substances *("to ease after effects")*	35.9	64.6	11.9	8.30	3.40	12.5
Help you to stay awake *("to stay awake")*	10.6	7.50	91.3	72.0	50.0	69.0
Help you lose your inhibitions *("to lose inhibitions")*	51.0	28.1	41.9	49.7	36.2	41.1
Enhance feelings when having sex *("to enhance sex")*	32.1	27.8	31.9	63.1	25.9	52.4
Help you stop worrying about a problem *("to stop worrying")*	55.1	57.7	22.5	32.5	15.5	41.7
Help make something you were doing less boring *("to decrease boredom")*	60.6	70.1	45.6	36.3	44.8	53.6
Help you to sleep/lose weight *("to sleep/lose weight")*[2]	30.4	69.6	23.1	7.00	-	6.00
Help you to concentrate or to work or study *("to work")*	6.40	20.9	29.4	3.20	1.71	6.00
Enhance an activity such as listening to music or playing a game or sport *("to enhance activity")*	51.6	72.8	66.2	79.6	72.4	60.7
Mean NUMFUN score (total number different functions endorsed) score (range)	8.96 (0-17)	9.10 (0-17)	7.79 (0-16)	7.98 (0-16)	5.93 (0-15)	7.77 (0-17)
Mean TOTFUN (total frequency of functions) score (range)	19.4 (0-52)	21.7 (0-48)	18.6(0-42)	20.0 (0-49)	14.0 (0-37)	18.5 (0-52)

[1] *Abbreviations for these items shown in brackets are used throughout the rest of this chapter.*
[2] *Based on pilot data, "to help sleep" was asked for alcohol and cannabis and "to lose weight" was asked for the stimulants. Neither were relevant to LSD users.*

The following sections present data on the top three most popular functions for each drug, together with the results from *t*-tests and chi-squared tests where age or gender differences were observed in the items endorsed.

Alcohol

The functions for alcohol use were the most diverse of the six substances examined in the study. The most commonly endorsed purpose for drinking was *"to get intoxicated"* (89.1%). Many also used alcohol to *"to relax"* (82.7%) and to *"enjoy company"* (74.0%). Overall, 11 of the 17 function items were endorsed by more than 50% of those who had drunk alcohol in the past year. Male respondents were more likely to report using alcohol in combination with other drugs either *"to improve effects"* of other drugs (46.3% vs 34.3%; $\chi^2_{[1]}=4.56$, $p<0.05$) or *"to ease after effects"* of other substances (42.3% vs 27.7%); $\chi^2_{[1]}=7.07$, $p<0.01$). In contrast, using to *"to decrease boredom"* was endorsed by more females than males (67.2% vs 55.4%; $\chi^2_{[1]}=4.42$, $p<0.05$).

There were significant age differences on four of the function variables: those who drank *"to feel elated"* were significantly older (19.7 vs 18.6 years; $t_{[310]}= 3.67$, $p<0.001$), as were individuals who drank to help them *"to lose inhibitions"* (19.6 vs 19.1 years; $t_{[310]}= 2.36$, $p<0.05$). In contrast, respondents who reported using alcohol just *"to get intoxicated"* (19.2 vs 20.3 years; $t_{[310]}=-3.31$, $p<0.001$) or to *"to decrease boredom"* (19.2 vs 19.6 years; $t_{[310]}= -2.24$, $p<0.05$) were significantly younger than those who did not.

Cannabis

The most popular functions for cannabis use were using to *"to relax"* (96.8%), *"to get intoxicated"* (90.7%) and to *"to enhance activity"* (72.8%). Nine of the 17 function items were endorsed by more than half of the cannabis users. There was only one significant gender difference in the functional use of cannabis: male respondents were significantly more likely to say that they had used cannabis *"to keep going"* than female users (41.5% vs 28.7%; $\chi^2_{[1]}=6.10$, $p<0.05$).

There were statistically significant age differences on four of the function variables: cannabis users who reported using this drug in the past year *"to feel elated"* or *"to sleep"* were significantly older than those who had not used cannabis for these purposes (19.6 vs 19.0 years; $t_{[343]}= 3.32$, $p<0.001$; 19.4 vs 19.0 years; $t_{[343]}= 2.01$,

$p<0.05$). In contrast, those who had used cannabis *"to increase confidence"* and *"to stop worrying"* tended to be younger than those who had not (19.0 vs 19.4 years; $t_{[343]}= -2.26$, $p<0.05$; 19.1 vs 19.5 years; $t_{[343]}= -1.99$, $p<0.05$).

Amphetamines

The most common functions for amphetamine use were *"to keep going"* (95.6%), *"to stay awake"* (91.3%) or *"to enhance activity"* (66.2%). Seven of the 17 function items were endorsed by more than half of respondents who had used amphetamines in the past year. As with cannabis, gender differences were uncommon: females were more likely to use amphetamines *"to lose weight"* than male respondents (39.2% vs 8.8%; $\chi^2_{[1]}=21.67, p<0.001$).

Significant age differences were found on four function variables. Individuals who reported using amphetamines in the past year *"to feel elated"* were significantly older than those who did not (19.8 vs 19.0 years; $t_{[163]}= 3.01$, $p<0.01$). In contrast, respondents who had used amphetamines *"to stop worrying"* (18.8 vs 19.7; $t_{[163]}= -2.61$, $p<0.01$), *"to decrease boredom"* (19.2 vs 19.8 years; $t_{[163]}= -2.28$, $p<0.05$), or *"to enhance activity"* (19.2 vs 20.0 years; $t_{[163]}= -2.62$, $p<0.01$) were younger than those who had not.

Ecstasy

The most popular functions for ecstasy use were similar to those for amphetamines. Ecstasy was commonly used *"to keep going"* (91.1%), *"to enhance activity"* (79.6%) and *"to feel elated"* (77.7%). Seven of the 17 function items were endorsed by more than half of those who had used ecstasy in the past year and female users were more likely to use ecstasy *"to lose weight"* than male respondents (14.3% vs 1.0%; Fishers exact test, $p < 0.001$).

As with the other drugs discussed above, respondents who reported using ecstasy *"to feel elated"* were significantly older than those who did not (19.8 vs 18.8 years; $t_{[164]}= 2.98$, $p<0.01$). In contrast, those who had used the drug *"to feel better"* (19.3 vs 19.6 years; $t_{[164]}= -1.99$, $p<0.05$) and *"to stop worrying"* (19.0 vs 19.8 years; $t_{[164]}= -2.70$, $p<0.01$) tended to be younger.

LSD

Of the six target substances examined in this study, LSD was associated with the least diverse range of functions. Nevertheless, all but two of the function statements were endorsed by at least some users, but only five were reported by more than 50%. The most common purpose for consuming LSD was *"to get intoxicated"* (77.6%). Other functions frequently cited included *"to feel elated"* (72.4%) and *"to enhance activity"* (72.4%). No gender or age differences were observed on any of the LSD function variables.

Cocaine

In common with ecstasy and amphetamines, the most widely endorsed functions for cocaine use were to help *"to keep going"* (84.5%), *"to stay awake"* (69.0%) and *" to increase confidence"* (66.1%). However, unlike the other stimulant drugs, almost two thirds of the cocaine users had consumed this drug within the past year *"to feel better"* (61.9%). Ten of the 17 function items were endorsed by more than half of the cocaine users.

Gender differences were more common in functions for cocaine use than the other substances surveyed. Males were more likely to report that they had used cocaine during the past year *"to improve effects"* of other drugs (33.0% vs 18.5%; $\chi^2_{[1]}$=4.63, p<0.05); female users were more likely to have used the drug *"to stay awake"* (80.2% vs 57.1%; $\chi^2_{[1]}$=10.51, p<0.001), *"to lose inhibitions"* (51.9% vs 29.7%; $\chi^2_{[1]}$=8.77, p<0.01), *"to stop worrying"* (51.9% vs 30.8%; $\chi^2_{[1]}$=7.89, p<0.01) or to *"enjoy company"* of friends (67.9% vs 52.7%; $\chi^2_{[1]}$=4.10, p<0.05). All respondents who reported using cocaine *"to lose weight"* were female.

Respondents who had used cocaine *"to feel better"* (18.9 vs 19.8 years; $t_{[170]}$= -3.12, p<0.01), *"to stop worrying"* (18.6 vs 19.7 years; $t_{[170]}$= -3.92, p<0.001) or *"to decrease boredom"* (18.9 vs 19.6 years; $t_{[170]}$= -2.59, p<0.05) were significantly younger than those who had not used for this function. Similar to the other drugs, respondents who had used cocaine *"to feel elated"* in the past year tended to be older than those who had not (19.6 vs 18.7 years; $t_{[170]}$= 3.33, p<0.01).

Scale development

The function items were factor analysed using PCA. No evidence for a strong factor structure across drugs was found. The only consistent finding was the existence of one weak central factor which accounted for a relatively small proportion of the variance in scores (less than 30%) (see table P1 in appendix P).

Much of the literature on reasons and motivations for substance use has focused on two types of reason (using a substance to "relieve negative affect" or to "enhance social interactions" (e.g. Farber et al., 1980; Segal et al., 1980; Ratliff & Burkhart, 1984; Cooper et al., 1988; Haden & Edmundson, 1991; Bradizza et al., 1997; Carey & Correia, 1997; Williams & Clark, 1998;). The current dataset was therefore examined to assess if it would support the extraction of two subscales to measure functions of this type. The first step in this process was to group eight of the scale items '*a priori*' into a three-item 'negative mood function' (NMF) subscale and a five-item 'social function' (SF) subscale (referred to as NMF scale and SF scale hereafter). PCA was then conducted on each of these subscales to confirm that they represented a single underlying factor. The resulting matrices for the SF subscale suggested that two items were unrelated to the others for LSD, and one for alcohol and for amphetamines. This was not unexpected given the considerable variation in the psychoactive effects of the six substances. These items were therefore removed from the subscales for these drugs. Table 5.9 summarises the content of the final NMF and SF scales for each drug, together with the mean scale scores and Cronbach's alpha coefficients.

Table 5.9 Summary of items in NMF and SF subscales together with Cronbach's alpha coefficients

		Alcohol	*Cannabis*	*Amphet.*	*Ecstasy*	*LSD*	*Cocaine*
Negative Mood subscale (NMF)		FEEL BETTER	FEEL BETTER	FEEL BETTER	FEEL BETTER	FEEL BETTER	FEEL BETTER
		STOP WORRYING	STOP WORRYING	STOP WORRYING	STOP WORRYING	STOP WORRYING	STOP WORRYING
		DECREASE BOREDOM	DECREASE BOREDOM	DECREASE BOREDOM	DECREASE BOREDOM	DECREASE BOREDOM	DECREASE BOREDOM
Mean score		1.30	1.45	0.73	0.82	0.53	1.05
Cronbach's alpha		0.73	0.69	0.65	0.64	0.54	0.65
Social Function subscale (SF)		ENJOY COMPANY	ENJOY COMPANY	ENJOY COMPANY	ENJOY COMPANY	ENJOY COMPANY	ENJOY COMPANY
		INCREASE CONFIDENCE	INCREASE CONFIDENCE	INCREASE CONFIDENCE	INCREASE CONFIDENCE	-	INCREASE CONFIDENCE
		LOSE INHIBITIONS	LOSE INHIBITIONS	LOSE INHIBITIONS	LOSE INHIBITIONS	LOSE INHIBITIONS	LOSE INHIBITIONS
		KEEP GOING	KEEP GOING	KEEP GOING	KEEP GOING	-	KEEP GOING
		-	ENHANCE ACTIVITY	-	ENHANCE ACTIVITY	ENHANCE ACTIVITY	ENHANCE ACTIVITY
Mean score		1.48	1.06	1.50	1.66	1.26	1.50
Cronbach's alpha		0.60	0.58	0.64	0.72	0.59	0.68

- Item removed from scale as explained in latter paragraph.

Cronbach's alpha coefficients were generally acceptable (above 0.60), with the exception of LSD for the NMF scale, and LSD and cannabis for the SF scale, which were just below this threshold 0.58 and 0.59 respectively). Mean scores on the NMF scale were highest for alcohol and cannabis and lowest for LSD. In contrast, ecstasy scored highest on the SF scale, closely followed by amphetamines and cocaine.

Further PCA confirmed that the items in each subscale loaded on a single factor. Factor loadings for each subscale by drug are presented in tables P2 and P3 in appendix P. PCA failed to find any common structure among the ten remaining function items for the six target substances. The inter-item correlations are summarised in tables P4 to

P9 in appendix P. Overall, these correlations were generally low to moderate (all but three were less than 0.40), suggesting that the items were essentially independent of each other. These were therefore retained as single items in subsequent analyses. Similarly, the intercorrelations between the NMF and SF subscales for each drug were weak to moderate, averaging 0.41. This suggested that the subscales were sufficiently different from each other to warrant separate consideration.

There were gender differences for one drug only: female cocaine users tended to score higher than male users on the NMF scale (3.69 vs 2.69; $t_{[170]}$= -2.44, p<0.05) and the SF scale (8.33 vs 6.71; $t_{[170]}$= -2.48, p<0.05).

5.3.2.2 Problem measures

Table 5.10 summarises the proportion of users of each drug who had experienced problems relating to their substance use within the year prior to interview. It also shows the mean frequency scores for each item by drug in brackets.

Table 5.10 Proportion of users who had experienced problems relating to their substance use in the past year (with mean frequency scores in brackets)

	Problem item	Alcohol (n=300)	Cann. (n=345)	Amphet. (n=165)	Ecstasy (n=164)	LSD (n=62)	Cocaine (n=172)
1.	*Have you been pre-occupied by thoughts about using [substance]?*	60.6% (1.13)	80.6% (1.61)	59.4% (0.92)	73.9% (1.04)	51.6% (0.84)	65.1% (1.14)
2.	*Have you been worried or concerned about your [substance] use?*	48.7% (0.83)	47.0% (0.73)	50.9% (0.80)	56.0% (0.85)	33.9% (0.50)	47.7% (0.76)
3.	*Has your [substance] use led to problems with family, friends, work etc.?*	52.6% (0.85)	40.6% (0.64)	44.8% (0.71)	38.0% (0.56)	25.8% (0.40)	41.9% (0.67)
4.	*Have you prioritised spending money on [substance] over other things?*	64.4% (1.28)	73.9% (1.57)	46.1% (0.77)	57.2% (1.05)	30.6% (0.47)	65.1% (1.30)
5.	*Has your use of [substance] led you to neglect what was normally expected of you?*	61.5% (1.06)	56.5% (0.99)	50.9% (0.84)	50.0% (0.76)	38.7% (0.61)	38.4% (0.63)
6.	*Have you regretted what you did when you were high or intoxicated on [substance]?*	84.3% (1.93)	39.7% (0.58)	53.3% (0.83)	60.8% (1.08)	48.4% (0.81)	56.4% (1.03)
7.	*Have you used more [substance] than you intended to?*	93.3% (2.39)	82.3% (1.99)	76.1% (1.27)	63.3% (1.37)	48.4% (0.98)	64.5% (1.37)

For alcohol, cannabis and amphetamines, the most widely endorsed item related to loss of control (item seven), while being preoccupied with thoughts about using was most common among users of the other three drugs. However, without exception, the highest mean score for each drug (shown in the table in brackets), was on item seven, indicating that loss of control was the most frequently experienced problem, even if not the most prevalent. Chi squared tests were performed to examine the data for gender differences in the proportion of users endorsing each of the seven items. Significant differences were found on items relating to cannabis use only. Items three, five and six were more likely to be reported by male cannabis users than female users of this drug (47.7% vs 31.3%: $\chi^2_{[1]}=9.41$, $p<0.01$; 61.5% vs 50.0%: $\chi^2_{[1]}=4.59$, $p<0.05$; 47.2% vs

30.0%: $\chi^2_{[1]}$=10.45, p<0.001 respectively). There were no gender differences observed on the problem items for any of the other drugs.

Scale development

Scores on the seven problem items for each drug were entered into PCA. In each case the items loaded on a single factor (see table P10 in appendix P for the eigenvalues and factor loadings for each item by drug). Table 5.11 summarises the mean scale scores and Cronbach's alpha coefficients for each substance.

Table 5.11 Summary of mean problem scale scores by drug together with Cronbach's alpha coefficients

	Alcohol (n=300)	**Cann. (n=345)**	**Amphet. (n=165)**	**Ecstasy (n=164)**	**LSD (n=62)**	**Cocaine (n=172)**
Mean scale score (range)	9.47 (0-28)	8.11 (0-25)	6.13 (0-22)	6.71 (0-20)	4.61 (0-18)	6.91 (0-24)
Cronbach's alpha	0.70	0.84	0.82	0.78	0.85	0.85

The mean problem scores were highest for alcohol and cannabis (the most commonly used drugs) and lowest for LSD. There were no significant gender differences in problem scale scores for any of the target drugs. Cronbach's alphas were high (over 0.70), indicating that the problem scales for each substance had good internal reliability.

5.3.2.3 Negative effects

Table 5.12 summarises the proportion of users of each drug who had experienced each negative effect within the year prior to interview. It also shows the mean frequency scores for each item by drug in brackets.

Table 5.12 Proportion of users who reported experiencing negative effects within the past year (with mean frequency scores in brackets)

Negative effects items	Alcohol (n=300)	Cann. (n=345)	Amphet. (n=165)	Ecstasy (n=164)	LSD (n=62)	Cocaine (n=172)
1. *Felt sick or unwell as a result of using [substance].*	96.0% (2.00)	55.1% (0.71)	64.4% (1.22)	66.7% (1.11)	42.9% (0.46)	48.4% (0.72)
2. *Wished that the effects of [substance] would reduce or stop.*	71.9% (1.22)	30.3% (0.43)	51.6% (0.94)	45.2% (0.63)	60.4% (0.90)	31.5% (0.49)
3. *Felt anxious or nervous as a result of using [substance].*	20.8% (0.31)	39.4% (0.63)	62.8% (1.15)	49.7% (0.74)	70.3% (0.98)	46.2% (0.87)
4. *Had an accident or taken unnecessary risks as a result of using [substance].*	65.7% (1.10)	21.1% (0.30)	28.2% (0.46)	32.8% (0.52)	35.2% (0.54)	31.0% (0.58)

Overall, negative effects seemed less prevalent among cocaine and cannabis users with less than half of users having experienced each item (except for feeling sick or unwell after using cannabis, which was endorsed by 55% of users). Feeling sick or unwell was the most commonly reported negative effect for all drugs with the exception of LSD. Feeling anxious or nervous was the most commonly reported negative effect in association with use of this drug and this item was also endorsed by a larger proportion of the stimulant users compared with alcohol and cannabis users. Having had an accident or having taken an unnecessary risk was endorsed by just under two thirds (65.7%) of the alcohol users. This proportion was approximately double that for any of the other substances.

Male cannabis users were significantly more likely to report having *"had an accident or taken an unnecessary risk as a result of using"* this drug (25.9% vs 15.0%: $\chi^2_{[1]}=6.09$, $p<0.01$). Similarly, male LSD users were more likely to report having *"felt sick or unwell as a result of using"* this drug and having *"felt anxious or nervous as a result of using"* (50.0% vs 25.9%: $\chi^2_{[1]}=4.49$, $p<0.05$; 78.1% vs 51.9%: $\chi^2_{[1]}=6.28$, $p<0.05$ respectively). No other gender differences were observed in the problem items.

Scale development

Scores on the four negative effects items for each drug were entered into PCA. In each case the items loaded on a single factor (see table P11 in appendix P for the eigenvalues and factor loadings for each negative effect item by drug). Table 5.13 summarises the mean scale scores (maximum possible = 16.0) and Cronbach's alpha coefficients for each substance.

Table 5.13 Summary of mean negative effect scale scores by drug together with Cronbach's alpha coefficients

	Alcohol (n=300)	**Cann. (n=345)**	**Amphet. (n=165)**	**Ecstasy (n=164)**	**LSD (n=62)**	**Cocaine (n=172)**
Mean score (range)	4.75 (0-13)	2.06 (0-11)	3.77 (0-12)	2.99 (0-13)	2.84 (0-15)	2.70 (0-12)
Cronbach's alpha	0.63	0.65	0.66	0.67	0.78	0.72

The mean negative effects score was highest for alcohol and amphetamines and lowest for cannabis. *T*-tests revealed just one gender difference in negative effects scale scores: male cannabis users scored significantly higher on this scale than female users (2.37 vs 1.67; $t_{[337]}$=3.01, p<0.01). Cronbach's alphas ranged from 0.63 (alcohol) to 0.78 (LSD) indicating acceptable to good internal reliability for the negative effect scales for each drug.

5.3.3 Inferential statistics

This section examines relationships between variables at the bivariate level.

5.3.3.1 Correlations between problem scores and function measures

Pearson's correlations between the four function measures (NUMFUN, TOTFUN, NMF scale and SF scale) and problem scores are presented in table 5.14.

Table 5.14 Correlations between problem scores and function measures

	Problem score					
	Alcohol	**Cannabis**	**Amphet.**	**Ecstasy**	**LSD**	**Cocaine**
NUMFUN *(Total number of functions - past year)*	0.573***	0.429***	0.472***	0.432***	0.327**	0.491***
TOTFUN *(Total function score – past year)*	0.641***	0.486***	0.524***	0.406***	0.348**	0.501***
NMF *(Negative mood functions)*	0.636***	0.469***	0.386***	0.431***	0.504***	0.555***
SF *(Social functions)*	0.479***	0.323***	0.428***	0.330***	0.232	0.328***

** $p < 0.01$, *** $p < 0.001$.

Problem scores were highly correlated with all four function measures for all drugs with just one exception: the correlation between SF scores and problem scores for LSD did not reach significance. Overall, these findings suggest a strong relationship between functions for substance use and problem scores existed in the data.

5.3.3.2 Correlations between future expectation ratings and functions measures

Pearson's correlations between the function measures and future use expectations are presented by drug in table 5.15.

The total number of different functions endorsed for use of the six drugs in the past year (NUMFUN) was positively correlated with future expectation ratings for all drugs except cannabis. Similarly, the TOTFUN scores were significantly correlated with ratings for all drugs except alcohol.

Table 5.15 Correlations between future expectation ratings and function measures

	Future expectations					
	Alcohol	**Cannabis**	**Amphet.**	**Ecstasy**	**LSD**	**Cocaine**
NUMFUN *(Total number of functions - past year)*	0.122*	0.105	0.249***	0.380***	0.332**	0.262***
TOTFUN *(Total function score – past year)*	0.090	0.115**	0.283***	0.385***	0.360**	0.262***
NMF *(Negative mood functions)*	-0.031	0.076	0.138	0.233**	0.009	0.250***
SF *(Social functions)*	0.110*	0.080	0.149	0.259***	0.069	0.231**

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Correlations with the NMF and SF subscales were generally much weaker than for TOTFUN and NUMFUN variables. Only correlations for ecstasy and cocaine reached significance for both NMF and SF variables. A weak correlation between alcohol expectations and SF scores was additionally observed ($p<0.05$). These correlations suggest a strong relationship between the overall extent of functional substance use and future expectations for use of the less frequently used target drugs (i.e. amphetamines, ecstasy, cocaine and LSD). The results for cannabis and alcohol were less clear.

5.3.3.3 Correlations between consumption and function measures

Table 5.16 shows Pearson's correlations between the two consumption measures (frequency and amount – the latter is shown in brackets in the table) and the four function measures.

Significant positive correlations were observed between the total number of different functions (NUMFUN) and frequency of alcohol, cannabis, amphetamine and cocaine use. The NUMFUN variable was also positively associated with the typical amount used for ecstasy, LSD and cocaine. Correlations between patterns of recent

substance use and the TOTFUN scores were generally stronger, reaching statistical significance for both frequency of use and typical amount for all drugs, except LSD where frequency of use did not reach significance.

Table 5.16 Correlations between consumption measures (frequency and typical amount used) and function measures

	Current frequency of use (amount)					
	Alcohol	**Cannabis**	**Amphet.**	**Ecstasy**	**LSD**	**Cocaine**
NUMFUN *(Total number of functions - past year)*	0.338*** (0.055)	0.170 ** (0.096)	0.189* (0.087)	0.119 (0.197*)	0.067 (0.402**)	0.226** (0.323***)
TOTFUN *(Total function score – past year)*	0.403*** (0.126*)	0.310*** (0.240***)	0.200* (0.196*)	0.169* (0.180*)	0.122 (0.420**)	0.245** (0.340***)
NMF *(Negative mood functions)*	0.300*** (0.113*)	0.154** (0.207***)	0.179* (0.092)	0.324*** (0.234**)	0.360** (0.132)	0.348*** (0.264***)
SF *(Social functions)*	0.238*** (-0.018)	0.117* (0.145**)	0.039 (0.232**)	0.047 (0.067)	-0.111 (0.431**)	0.160* (0.207**)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Positive correlations were observed between NMF subscale scores and frequency of recent use for each drug. Between 2% and 13% of the variance in frequency of use was accounted for by NMF scores[1]. This scale was also correlated with typical amount for alcohol, cannabis, ecstasy and cocaine. In contrast, the SF scale did not correlate with either of the ecstasy consumption measures, nor frequency of amphetamine or LSD use, nor the typical amount of alcohol consumed. Positive correlations were observed between consumption measures and the SF scale for the other drugs. With the exception of alcohol, the relationship with amount used tended to be stronger than that for frequency of use.

[1] *Here (and elsewhere in this section), the percentage variance was obtained using the formula $100(r^2)$, where r is the correlation coefficient.*

Creating a composite consumption measure

With the exception of amphetamines and LSD, frequency and amount used were highly intercorrelated for each substance (cannabis r=0.525, p<0.001; amphetamines r=0.136, n.s.; ecstasy r=0.407, p<0.001; LSD r=0.016, n.s; cocaine r=0.300, p<0.001; alcohol r=0.273, p<0.001) and did not produce differential patterns of correlations. It therefore seemed desirable to combine both measures to create a composite consumption measure for the main analyses. To do this, the frequency and amount variables were multiplied together to generate a measure of consumption 'intensity' (or total amount consumed) during the three months prior to interview (see table P12 in appendix P).

Males reported significantly more intensive use of both alcohol (494 units vs 331 units; $t_{[290]}$= 3.16, p<0.01) and cannabis (136g vs 102g; $t_{[342]}$= 2.72, p<0.01) than female users of these substances. No significant differences in intensity of use for the other drug types were found by gender. The intensity scores were then ranked (with tied ranks averaged) to prevent outliers from distorting the regression analyses. Table 5.17 presents correlations between the function measures and this new variable for each drug.

Table 5.17 Correlations between intensity of substance use in past 90 days (frequency multiplied by amount) and function measures

	Intensity of use (frequency x amount)					
	Alcohol	**Cannabis**	**Amphet.**	**Ecstasy**	**LSD**	**Cocaine**
NUMFUN *(Total number of functions - past year)*	0.315***	0.151**	0.294***	0.309***	0.223	0.426***
TOTFUN *(Total function score – past year)*	0.380***	0.314***	0.379***	0.281***	0.359**	0.421***
NMF *(Negative mood functions)*	0.300***	0.213***	0.298**	0.368***	0. 389**	0.521***
SF *(Social functions)*	0.193***	0.148**	0.266***	0.155*	0.181	0.259***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Intensity of use was positively correlated with all function scores for all drugs except LSD where correlations with NUMFUN and SF variables did not reach

significance. As these two correlations were of a similar size to those reported for the other drugs, it is possible that this finding was due to an insufficient number of LSD users in the sample.

5.3.3.4 Correlations between consumption measures and measures of peer use

Table 5.18 presents correlations between the two measures of peer use (proportion of peers who are current users and partner/best friend's current use) and the three consumption measures (frequency, typical amount and intensity).

Table 5.18 Correlations between consumption measures and measures of peer use

	Alcohol	Cannabis	Amphet.	Ecstasy	LSD	Cocaine
i. Frequency of use						
Current peer use	0.100	0.189***	0.212**	0.285***	0.248	0.288***
Partner/best friend's use	0.091	0.053	0.186*	0.229**	-0.054	0.069
ii. Typical amount						
Current peer use	0.133*	0.136*	0.201*	0.306***	-0.061	0.373***
Partner/best friend's use	0.028	-0.014	0.075	0.244**	-0.135	0.168*
iii. Intensity						
Current peer use	0.089	0.183***	0.217**	0.292***	0.256*	0.319***
Partner/best friend's use	0.063	0.006	0.184*	0.213**	-0.098	0.085

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Current peer use was significantly correlated with all measures of consumption for all drugs except LSD and alcohol. Significant correlations between current peer use and the composite recent intensity score ranged from 0.18 (cannabis) to 0.32 (cocaine), suggesting that between just 3% and 10% of the variance in consumption intensity was explained by peer use. In contrast, partner/best friend's substance use was only consistently correlated with ecstasy consumption measures. In all cases, correlations with current peer use were stronger than corresponding correlations with partner/best friend's substance use.

Overall, these correlations provide evidence for a generally consistent positive relationship between some measure of consumption and peer use. However, the

majority of the variance in consumption scores remained unaccounted for. In order to explain more of this unaccounted variance, a series of multivariate regression analyses were conducted (see section 5.3.4.1).

5.3.3.5 Correlations between consumption, problem scores and future expectations

As discussed previously (see Chapter One), a close relationship between higher levels of substance use (i.e. more frequent use and heavier consumption) and problems associated with use has been documented. There is also evidence in the literature that past behaviour is a strong predictor of future behaviour (Bentler & Speckhart, 1979; Bachman et al., 1984; Newcomb & Bentler, 1986; Newcomb, 1995; Sutton, 1994, 1998). In this section, Pearson's correlations were calculated to examine these relationships within the current sample.

Table 5.19 summarises the correlations between the three consumption measures and i) problem scores and ii) future expectation ratings for each of the six target drugs.

Table 5.19 Correlations between consumption measures and problem scores and future expectations

	Alcohol	**Cannabis**	**Amphet.**	**Ecstasy**	**LSD**	**Cocaine**
i) Problem scores						
Freq in past 90 days	0.440***	0.273***	0.235**	0.330***	0.144	0.550***
Typical amount	0.122*	0.261***	0.138	0.386***	0.175	0.353***
Intensity of use	0.390***	0.302***	0.300***	0.500***	0.314*	0.646***
ii) Future expectations						
Freq in past 90 days	0.191***	0.340***	0.382***	0.298***	0.229	0.359***
Typical amount	0.164**	0.117*	0.161*	0.325***	0.044	0.200*
Intensity of use	0.225***	0.318***	0.517***	0.496***	0.347**	0.553***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

A strong positive association was found between problem scores and frequency of current use for all substances except LSD. Similarly, strong correlations were observed between problem scores and typical amount used for cannabis, ecstasy,

cocaine and alcohol. Correlations ranged from 0.12 (alcohol) to 0.39 (ecstasy) suggesting that between 1% and 15% of the variance in problem scores was explained by the typical amount used. Finally, correlations between problem scores and the intensity of use composite measures were significant for all drugs and were generally stronger than those with either frequency or quantity scores. Between 9% (amphetamines) and 42% (cocaine) of the variance in problem scores was explained by recent intensity of use.

Intensity of use was consistently correlated with future expectation ratings for all six drugs. Similar relationships were observed between future expectations and frequency and typical amount used for all drugs with the exception of LSD. Nevertheless, it should be noted that the correlations with LSD consumption measures were generally of a similar size to those observed in other drugs. The small number of cases using LSD meant that only relatively large effects would be detectable and reach significance. Correlations with intensity of use ranged from 0.23 (alcohol) to 0.55 (cocaine) suggesting that between 5% and 30% of the variance in future expectation scores was explained by intensity of use.

These findings clearly suggest a strong relationship between level of consumption and problems and future expectations in all six drugs. However, a large proportion of the variance in problem scores and future expectation ratings remained unaccounted for. To try to explain more of this unaccounted variance, a series of multivariate regression analyses were conducted (see sections 5.3.4.2 and 5.3.4.3).

5.3.3.6 Correlations between consumption measures and negative effects scores

The only drug in which consumption measures were consistently significantly correlated with negative effects was cocaine. For alcohol, the typical frequency and intensity were positively correlated with negative effects scores (r=0.258, p<0.001 and r=0.157, p<0.01 respectively) but typical amount appeared to be independent of this variable. For amphetamines, correlations with the typical amount and intensity reached significance but did not for frequency of use. In contrast all three consumption measures for cannabis, ecstasy and LSD appeared to be relatively independent of the negative effects variables for these drugs (see table 5.20).

Table 5.20 Correlations between consumption measures and negative effects scores

	Negative effects scores					
	Alcohol	**Cannabis**	**Amphet.**	**Ecstasy**	**LSD**	**Cocaine**
Freq. In past 90 days	0.258***	-0.073	0.141	0.137	0.117	0.395***
Typical amount	0.077	-0.043	0.214**	0.077	0.078	0.218**
Intensity of use	0.157**	-0.034	0.197*	0.115	0.156	0.359***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

5.3.4 Regression analyses

The next stage of the analyses involved using multiple regression analyses to model i) current use, ii) problems associated with use and iii) future expectations regarding use for each of the six target drugs and to test the main study hypotheses. LSD was omitted from these analyses as there were insufficient cases (61) to support the number of independent variables used (Tabachnick & Fidell 1989, 1996). The analyses for each of the three sets of dependent variables were conducted in two stages. First, sequential regression analyses were employed to assess the relative contribution of demographics, peer use, past substance use experience and functions for use in explaining variance in the dependent variable when these latter variables were controlled. In the second stage, the data were examined for evidence of interaction terms (moderation effects) between demographics and the other independent variables. These terms were then added to the full set of original variables in a backwards elimination regression equation. This process resulted in a final 'trimmed down' regression model for each dependent variable for each drug, thus allowing the primary influences on the dependent variable to be examined more closely.

5.3.4.1 Modelling current use

Five separate sequential multiple regression analyses (in which the predictor variables were entered in five blocks) were performed (one for each substance) using intensity of use as the dependent variable. Seventeen independent variables were entered into each equation. In order, these were:

- age
- gender

- age at first use
- perceived peer use
- partner/best friend's use
- NMF score
- SF score
- nine additional function score items
- negative effects score

In each equation, the intensity of use was ranked (with tied ranks averaged). Table 5.21 shows Pearson's correlations between these variables and intensity of use for each drug. The negative value obtained for gender and intensity of alcohol and cannabis use (r=-0.142, p<0.05; r=-0.145, p<0.01 respectively) indicates that males tended to use these drugs more intensively. Similar relationships were observed between age at interview and intensity of amphetamine and cocaine use, suggesting that more intensive use of these drugs was associated with younger respondents in this sample. Age of first use was negatively correlated with the dependent variable for all five drugs - on average, 8% of the variance in intensity scores was accounted for by age of first use. The extent of peer use was positively related to the dependent variable for all five substances but the relationship with partner/best friend only reached significance for the three stimulant drugs. For all five drugs, a positive relationship was observed between the dependent variable and the NMF and SF scores. In each case, correlations with NMF scores exceeded those with SF scores.

Overall, significant positive correlations were obtained between intensity of alcohol use and all of the function items with the exception of using alcohol *"to work"*. Similar relationships were observed between intensity of cannabis use and all the function items except using *"to feel elated"* and using *"to stay awake"*. The only single function items that were consistently related to intensity of use for all drugs were using *"to enhance sex"* and *"to get intoxicated"*. Finally, negative effects scores were positively related to the dependent variable for all drugs except cannabis. In particular, the correlation between these variables for cocaine was much stronger than those for the other drugs, suggesting that almost a fifth (19.2%) of the variance in recent intensity of cocaine use could be accounted for by negative effects scores.

Table 5.21 Pearson's correlations between independent variables (IVs) and intensity of use (ranked)

IVs	Alcohol (n=312)	Cannabis (n=345)	Amphetamines (n=165)	Ecstasy (n=166)	Cocaine (n=172)
Age	0.057	-0.111	-0.280***	-0.129	-0.389***
Gender	-0.142*	-0.145**	0.120	-0.030	0.031
Age of first use	-0.200***	-0.363***	-0.242***	-0.353***	-0.565***
Extent of peer use	0.158**	0.197***	0.348***	0.374***	0.483***
Partner/best friend's use	0.083	0.019	0.149*	0.363***	0.179*
NMF scale	0.300***	0.213***	0.298***	0.368***	0.521***
SF scale	0.193***	0.148**	0.266***	0.155*	0.259***
To enhance sex	0.124*	0.188***	0.236**	0.270***	0.388***
To get intoxicated	0.362***	0.214***	0.349***	0.188*	0.176*
To feel elated/euphoric	0.245***	0.000	0.086	-0.124	0.034
To relax	0.264***	0.224***	0.189*	0.092	0.090
To help stay awake	0.172**	0.079	0.191*	0.106	0.280***
To help sleep/lose weight	0.172**	0.202***	0.222**	0.128	0.162*
To help work	0.095	0.209***	0.052	0.053	0.064
To improve drug effects	0.254***	0.254***	0.061	0.113	-0.035
To ease after effects	0.282***	0.195***	0.084	0.149	0.257***
Negative effects	0.252***	-0.060	0.165*	0.170*	0.439***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The ratio of the number of cases to the number of predictor variables ranged from 20.3 to one (cannabis), to 9.7 to one (amphetamines), the latter exceeding a minimum ratio considered acceptable for multiple regression analysis (Tabachnick & Fidell 1989). The results from the multiple regressions are summarised in table 5.22. The table shows the standardised regression coefficients (β) for each step, R^2 and the amount that R^2 changed with the introduction of the new variables at each step.

The total proportion of variance in intensity scores predicted by the 17 independent variables ranged between 28% (24% adjusted) for alcohol and 55% (50% adjusted) for cocaine. R^2 was significantly different from zero in all of the equations (alcohol: $F_{[17,294]}$=6.74, p<0.001; cannabis: $F_{[17,327]}$=7.89, p<0.001; amphetamines: $F_{[17,147]}$=4.20, p<0.001; ecstasy: $F_{[17,148]}$=4.25, p<0.001; cocaine: $F_{[17,154]}$=11.1, p<0.001).

Sequential multiple regression analyses were conducted so that the relative contribution of different types of variables could be assessed in stages. In particular, the contribution made by the addition of the function variables was examined when peer use, age of first use and demographics were controlled (step 4). The addition of the function variables had a striking impact on the amount of variance in current intensity scores explained over and above that accounted for by demographics, age of first use and peer use (steps 1-3). While measures of peer use explained between 3% (cannabis and alcohol) and 8% (amphetamines, ecstasy and cocaine) of extra variance in intensity scores, the addition of the functions variables added between another 11% (cannabis and ecstasy) and 19% (alcohol).

In contrast, the addition of negative effects (step 5) had very little effect (adding between 0.1% and 2% to the proportion of variance explained), although this variable reached significance in the equations for cannabis and cocaine.

As can be seen from the correlations table (table 5.21), scores on NMF and SF scales were significantly positively correlated with intensity of use for all drugs. However, the fact that none of the beta weights (with the exception of NMF scores for ecstasy) for either of these two scales reached statistical significance in the regression equations indicates that the relationship between functions and intensity was explained by other variables measured. Similarly, the positive correlations shown in table 5.21 between the individual function items (such as using *"to relax"*) and intensity of alcohol use and cannabis use were also explained by other variables in the regression equation.

Using a substance *"to get intoxicated"* was strongly associated with recent intensity of alcohol use ($p<0.001$) and to a lesser extent with cannabis ($p<0.05$) and amphetamine use ($p<0.01$). In order to examine whether the effect of certain function items on the dependent variable might have been masked by the influence of using *"to get intoxicated"*, the regressions were re-run without this function item. This resulted in the NMF score and the item using *"to relax"* reaching significance in the equation for cannabis ($\beta=0.121$, $p<0.05$ and $\beta=0.106$, $p<0.05$ respectively). However there were no significant changes in the equations for the other four substances.

Significant associations were also found between using *"to ease after effects"* and using *"to improve effects"* of other drugs and intensity of alcohol and cannabis use respectively. Intensity of amphetamine use was also found to be associated with using *"to lose weight"* ($p<0.01$).

Age was a significant predictor for alcohol only, despite being strongly correlated with intensity scores for amphetamines and cocaine. The beta weight for age in the equation for alcohol was positive, suggesting that older respondents tended to drink more intensively.

Although age of first use was negatively correlated with intensity of use for all five substances, it reached significance in just three of the regression equations – for cannabis, ecstasy and cocaine. In each case, it was a negative predictor indicating that there was an association between initiating use at a younger age and more intensive current use, when current age, gender, peer use, functions and negative effects were controlled.

The introduction of the peer use variables (step 3) had a greater impact for the stimulant drugs than for alcohol and cannabis. The effect of these variables was generally reduced when functions and negative effects were also controlled (steps 4 and 5). Perceived current peer use played a significant role in the complete regression equations for all drugs and was the strongest predictor for just one of the five drugs (amphetamines). In contrast, partner/best friend's substance use did not reach significance in any of the equations. Further regressions in which current peer use was omitted from the independent variable list were conducted. Results suggested that for ecstasy the relationship between partner/best friend's use and intensity was masked by the contribution to the equation made by current peer use. However, partner/best friend's use contributed significantly to the other five equations.

Table 5.22 Summary of sequential multiple regressions modelling current intensity of use (continued overleaf)

	Alcohol (β) (n=312)					*Cannabis (β) (n=345)*				
IVs	Step 1	Step 2	Step 3	Step 4	Step 5	Step 1	Step 2	Step 3	Step 4	Step 5
Age	0.045	0.082	0.082	0.125*	0.113*	-0.128*	-0.020	-0.008	-0.044	-0.029
Gender	-0.138*	-0.110*	-0.135*	-0.148**	-0.150**	-0.152**	-0.097	-0.107*	-0.115*	-0.135**
Age of first use		-0.201***	-0.180**	-0.080	-0.076		-0.342***	-0.327***	-0.251***	-0.244***
Extent of peer use			0.154**	0.128*	0.132*			0.158**	0.128**	0.122*
Partner/best friend's use			0.035	0.014	0.015			0.009	-0.034	-0.043
NMF scale				0.133	0.088				0.055	0.095
SF scale				-0.061	-0.082				-0.047	-0.046
To enhance sex				-0.004	-0.007				0.078	0.084
To get intoxicated				0.257***	0.254***				0.126*	0.115*
To feel elated/euphoric				0.057	0.058				-0.041	-0.043
To relax				0.069	0.059				0.097	0.091
To help stay awake				0.075	0.081				0.037	0.030
To help sleep/lose weight				0.001	0.012				0.022	0.042
To help work				0.028	0.021				0.120*	0.123*
To improve drug effects				0.025	0.020				0.123*	0.124*
To ease after effects				0.120*	0.126*				0.026	0.038
Negative effects					0.103					-0.149**
R^2	0.022*	0.061***	0.087***	0.274***	0.281***	0.036**	0.139***	0.164***	0.272***	0.291***
R^2 *change*	-	0.039	0.026	0.187	0.007		0.103	0.025	0.108	0.019

*$p < 0.05$; **$p < 0.01$; *** $p < 0.001$

Table 5.22 Summary of standard multiple regressions modelling current intensity of use (continued)

	Amphetamines (β) (n=165)					*Ecstasy (β) (n=166)*					*Cocaine (β) (n=172)*				
IVs	Step 1	Step 2	Step 3	Step 4	Step 5	Step 1	Step 2	Step 3	Step 4	Step 5	Step 1	Step 2	Step 3	Step 4	Step 5
Age	-0.233**	-0.166*	-0.161*	-0.148	-0.150	-0.127	0.068	0.059	0.089	0.087	-0.374***	0.003	-0.037	-0.066	-0.083
Gender	0.086	0.101	0.104	0.013	0.008	-0.046	-0.051	-0.069	-0.072	-0.073	-0.048	-0.019	-0.036	-0.086	-0.067
Age of first use		0.161	-0.117	-0.083	-0.085		-0.401***	-0.312***	-0.223**	-0.223**		-0.586***	-0.446***	-0.363***	-0.333***
Extent of peer use			0.317***	0.261***	0.264***			0.195*	0.179*	0.180*			0.308***	0.209**	0.201**
Partner/best friend's use			-0.022	-0.086	-0.087			0.168*	0.117	0.118			0.015	-0.050	-0.026
NMF scale				0.091	0.090				0.262**	0.253**				0.197*	0.151
SF scale				0.028	0.031				-0.044	-0.054				-0.099	-0.106
To enhance sex				0.077	0.082				0.094	0.093				0.158*	0.137*
To get intoxicated				0.222**	0.225**				0.034	0.035				-0.022	-0.003
To feel elated/euphoric				0.006	0.008				-0.162*	-0.158				0.069	0.053
To relax				0.098	0.096				0.032	0.032				-0.010	0.007
To help stay awake				0.041	00.042				0.062	0.057				0.146	0.144
To help sleep/lose weight				0.214	0.222**				-0.003	0.013				0.077	-0.018
To help work				-0.027	-0.026				-0.021	-0.018				0.014	0.028
To improve drug effects				-0.021	-0.016				0.018	0.017				-0.031	-0.024
To ease after effects				-0.106	-0.109				0.072	0.077				0.101	0.064
Negative effects					-0.033					0.045					0.164*
R^2	0.059**	0.080**	0.157***	0.326***	0.327***	0.016	0.139***	0.220***	0.327***	0.328***	0.135***	0.340***	0.418***	0.533***	0.551***
R^2 *change*	-	0.021	0.077	0.169	0.001	-	0.123	0.081	0.107	0.001	-	0.205	0.078	0.115	0.018

*$p < 0.05$; **$p < 0.01$; *** $p < 0.001$

Interaction effects

To examine the data for interaction effects (moderation effects) between the main independent variables and age and gender, 150 further regressions were conducted using procedures recommended by Baron & Kenny (1986) (previously described in section 5.2.6). The results of these regressions provided evidence for eight interactions. For cannabis, gender appeared to interact with SF scores and current peer use; for ecstasy and cocaine gender interacted with the function item using *"to lose weight"*, and for alcohol interactions were apparent with using *"to ease after effects"*. Age seemed to interact with partner/best friend's use of cannabis; NMF scores for amphetamines and alcohol, and using alcohol *"to enhance sex"*.

Final intensity of use regressions

The regression equations were then re-run with the addition of the interaction terms identified above using backwards elimination. The results from this second set of equations for intensity of use are presented in table 5.23. The proportion of variance in intensity scores explained by these models ranged between 29% (26% adjusted) for alcohol and 53% (51% adjusted) for cocaine. R^2 was significantly different from zero in all of the equations (alcohol: $F_{[9,302]}$=13.4, p<0.001; cannabis: $F_{[12,332]}$=11.3, p<0.001; amphetamines: $F_{[7,157]}$=9.60, p<0.001; ecstasy: $F_{[8,157]}$=8.42, p<0.001; cocaine: $F_{[7,164]}$=26.4, p<0.001). Gender and age were controlled in all equations.

Age reached significance in just one regression equation for intensity of use, suggesting that heavier use was associated with younger users for amphetamines only (unlike in the earlier model). Again, unlike the earlier model, age did not contribute directly to the regression for alcohol intensity. This change can be explained by the finding that age interacted with NMF scores in its effect on the DV.

Scores on the NMF scales were significant predictors for current intensity of alcohol, ecstasy and cocaine use. As mentioned above, an interaction between this variable and age was observed for alcohol. The nature of this interaction (and others) was examined using the unstandardised beta weights from the regression equation to create a table of values which were then plotted on a graph (see figure 5.4). Three values were chosen for the main variable to illustrate how the moderator variable affected it at low, medium and high levels. In all cases the graph shows the relative contribution of the variables.

Table 5.23 Final regressions modelling current intensity of use

	Alcohol (n=312)	Cannabis (n=345)	Amphetamines (n=165)	Ecstasy (n=166)	Cocaine (n=172)
IVs	*β*	*β*	*β*	*β*	*β*
Age	-0.023	-0.023	-0.264**	-0.087	-0.077
Gender	-0.094	-0.038	0.008	-0.076	-0.065
Age of first use	-	-0.261***	-	-0.263**	-0.302***
Extent of peer use	0.141**	0.101*	0.225**	0.175*	0.210***
Partner/best friend's use	-	-	-	-	-
NMF scale	-1.09*	-	-	0.253***	0.191**
Age x NMF	1.26*	-	-	-	-
SF scale	-	0.304*	-	-	-
Gender x SF	-	-0.375*	-	-	-
To enhance sex	-	-	-	-	0.117*
To get intoxicated	0.266***	0.131**	0.219**	-	-
To feel elated/euphoric	-	-	-	-	-
To relax	-	-	-	-	-
To help stay awake	-	-	-	-	-
To lose weight	-	-	0.210**	-	-
To help work	-	0.125*	-	-	-
To improve drug effects	-	0.149**	-	-	-
To ease after effects	0.466**	-	-	-	-
Gender x after effects	-0.347*	-	-	-	-
Negative effects	-	-0.141**	-	-	0.187**
R^2	**0.285*** **	**0.291*** **	**0.300*** **	**0.300*** **	**0.530*** **
Adjusted R^2	**0.264**	**0.265**	**0.268**	**0.265**	**0.510**
Intercept	**114**	**266**	**200**	**131**	**232**

** $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$*

Figure 5.4 shows that NMF scores had a strong positive impact on intensity of alcohol use in older users, a weaker but still positive impact on those around 19 years old and a weak negative association with intensity scores in 16 year olds. In contrast to the first alcohol intensity regression, age was not a significant predictor in the final solution. This suggests that the relationship between age and intensity of alcohol use was explained by the addition of the above interaction term.

As found in the first set of equations, SF scores seemed less important than NMF scores. However, this variable did attain significance in the equation for cannabis use and an interaction between this variable and gender was observed. The nature of this interaction effect is illustrated in figure 5.5.

Figure 5.5 shows that while using cannabis for social functions had a weak positive relationship with the intensity of cannabis use in males, in females the relationship with intensity of use was strongly negative. This suggests that males who reported using cannabis for more social functions tended to use more intensively, whereas females who reported more social functions for use of this drug used much less intensively.

Findings regarding the single function items were very similar to those presented in the first set of equations for intensity of use (see p.220). However, the addition of interaction terms revealed that gender moderated the association between intensity of use and using *"to ease after effects"* of other drugs for alcohol. Figure 5.6 shows that the frequency of using alcohol to fulfil this function had a strong positive relationship with the intensity of alcohol use in males, but a very weak negative relationship with this variable in females.

Finally, as in the first set of equations for intensity of use (p.220), the extent of peer use of a drug significantly predicted the current intensity of use for all five drugs but the variable for partner/best friend's use did not reach significance. However, in none of the equations did the beta weight for the extent of peer use indicate that it was a stronger predictor than the other variables measured.

Figure 5.4 NMF interaction with age for intensity of alcohol use

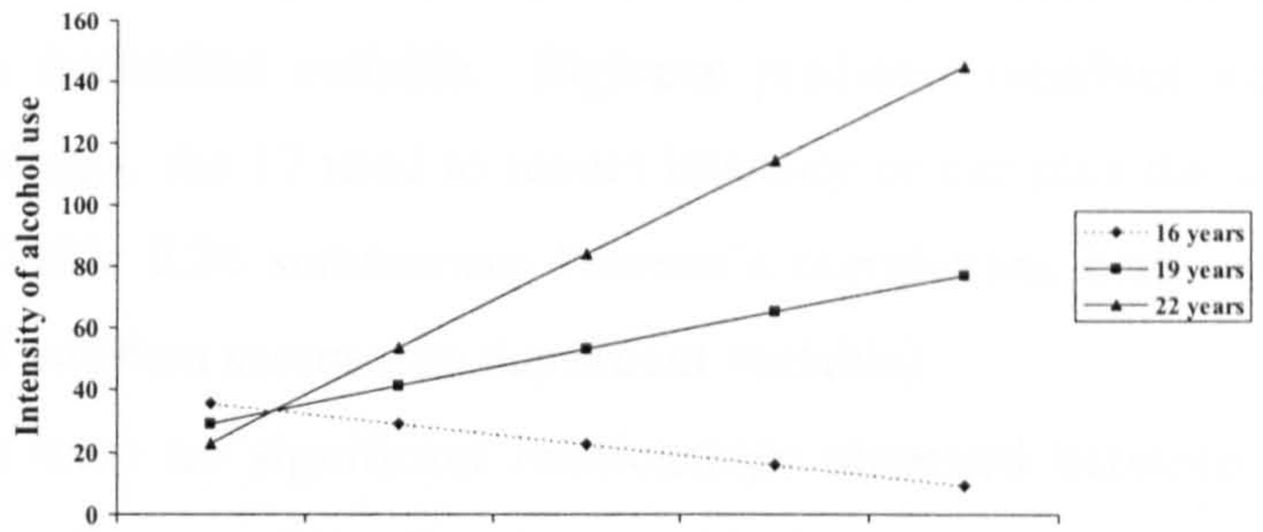


Figure 5.5 SF interaction with gender for intensity of cannabis use

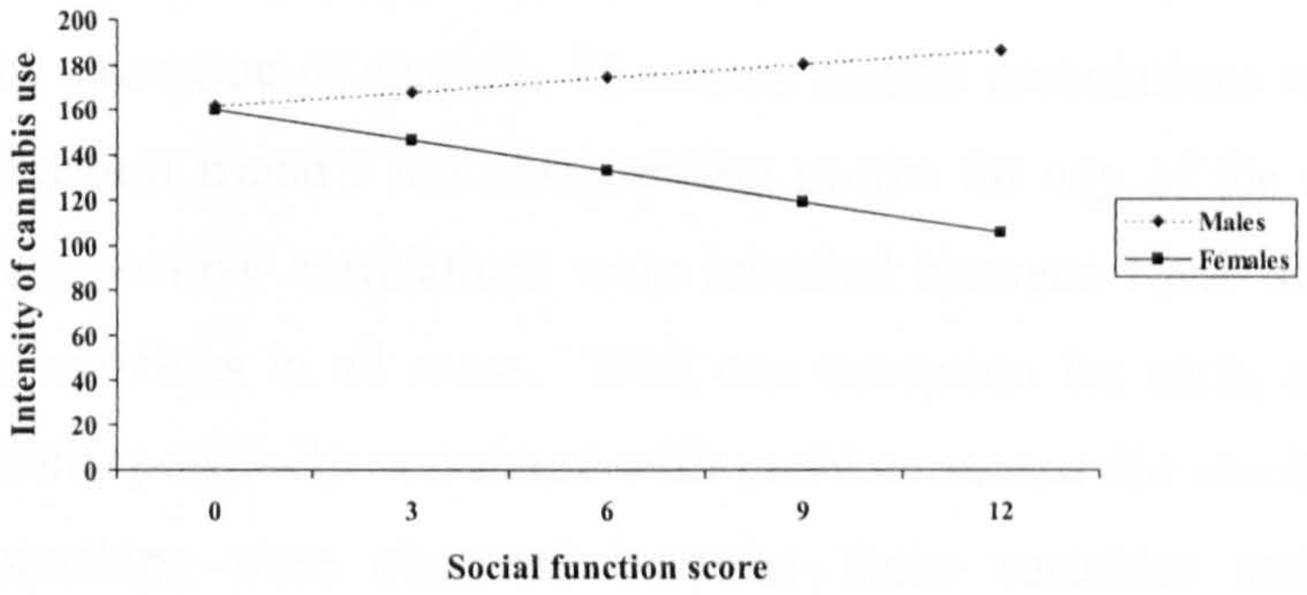
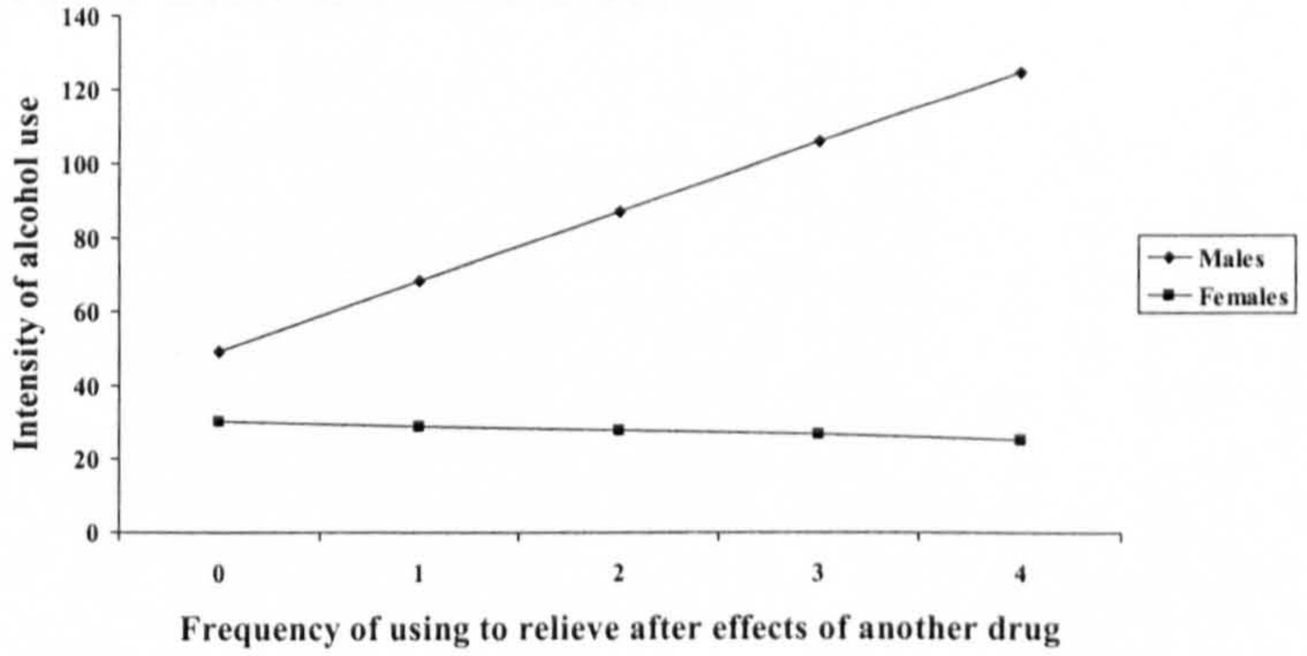


Figure 5.6 Using to relieve after effects interaction with gender for intensity of alcohol use



5.3.4.2 Modelling problem scores

A similar analytical sequence to that described for modelling intensity of current use in 5.3.4.1 was used to examine variables associated with problem scores. First, sequential multiple regression analyses were performed for each substance type using problem scores as the dependent variable. Eighteen predictor variables were entered into the equation in blocks: the 17 used to model intensity of use plus the intensity variable for each drug. Table 5.24 summarises Pearson's correlations between these independent variables and problem scores (the dependent variable).

There were no significant relationships observed between age or gender and problem scores for any of the five drugs, with the exception of cocaine. Here, age was negatively correlated with problem scores. In contrast, significant associations were observed between age at first use and problem scores for all five drugs. These relationships suggested that higher problem scores were related to starting use at a younger age and were strongest for ecstasy and cocaine.

Extent of peer use was positively correlated with the dependent variable for all drugs, with the exception of alcohol. However, similar associations were not observed between partner/best friend's use and problem scores for any of the drugs, except for ecstasy. Strong positive correlations were revealed between NMF and SF scores and the dependent variables in all cases. With one exception for each, all function items were significantly positively correlated with problem scores for alcohol and cannabis. Similar relationships were observed between these variables and the dependent variables for the stimulant drugs but were less consistent. Finally, negative effect scores were strongly positively correlated with problem scores for all five substances. The relationship between these pairs of variables was particularly strong for cocaine, suggesting that 36.1% of the variance in cocaine problem scores was accounted for by variance in negative effect scores for this drug.

Table 5.24 Pearson's correlations between independent variables and problem scores

IVs	Alcohol (n=312)	Cannabis (n=345)	Amphetamines (n=165)	Ecstasy (n=166)	Cocaine (n=172)
Age	0.027	-0.023	-0.127	-0.060	-0.203**
Gender	0.028	0.104	0.015	0.080	0.003
Age of first use	-0.139*	-0.119*	-0.157*	-0.307***	-0.379***
Extent of peer use	0.065	0.131*	0.222**	0.293***	0.340***
Partner/best friend's use	0.048	-0.046	0.057	0.221**	0.083
Current intensity of use	0.390***	0.302***	0.300***	0.500***	0.646***
NMF scale	0.636***	0.469***	0.386***	0.431***	0.555***
SF scale	0.479***	0.323***	0.428***	0.330***	0.328***
To enhance sex	0.201***	0.209***	0.207**	0.296***	0.422***
To get intoxicated	0.391***	0.208***	0.277***	0.162*	0.234**
To feel elated/euphoric	0.338***	0.213***	0.137	-0.009	0.165*
To relax	0.389***	0.131*	0.073	0.024	0.051
To help stay awake	0.154**	0.080	0.229**	0.109	0.224**
To help sleep/lose weight	0.344***	0.224***	0.131	0.292***	0.185*
To help work	0.101	0.216***	0.176*	0.045	0.117
To improve drug effects	0.314***	0.251***	0.246***	0.202**	0.015
To ease after effects	0.317***	0.169**	0.276***	0.045	0.383***
Negative effects	0.509***	0.381***	0.383***	0.459***	0.601***

** $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$*

The ratio of the number of cases to the number of predictor variables for these analyses ranged from 19.2 to 1 (cannabis) to 9.2 to 1 (amphetamines), the latter again exceeding a minimum ratio considered acceptable for multiple regression analysis (Tabachnick & Fidell, 1989). The results from these multiple regressions are summarised in table 5.25. The table shows the standardised regression coefficients (β), R^2 and R^2 change. Between 38% (amphetamines) and 62% (cocaine) of the variance in problem scores was predicted by the independent variables in these equations. R^2 was significantly different from zero for all five equations (alcohol: $F_{[18,293]}$=18.49, p<0.001; cannabis: $F_{[18,326]}$= 11.69, p<0.001; amphetamines: $F_{[18,146]}$=4.98, p<0.001; ecstasy: $F_{[18,147]}$=8.43, p<0.001; cocaine: $F_{[18,153]}$=14.0, p<0.001).

The most striking finding was that, with the exception of cocaine, the addition of the function variables (Step 5) made the greatest impact on the total amount of variance in problem scores explained in the equations. The R^2 change in this step ranged between 0.146 (cocaine) and 0.350 (alcohol), averaging at 0.216. This indicates that, on average, 21.6% of the variance in problem scores was explained by the function variables when demographics, age of first use, peer use and current intensity of use were controlled. For cocaine, the addition of the two peer-use variables (step 4) had the greatest impact on R^2 in the equation.

In particular, in the final equations (step 6) for alcohol, cannabis, and amphetamines, the beta weights for NMF scores were of the same order as those for intensity of use, suggesting effects of a similar magnitude. NMF scores also made a significant contribution to the equation for cocaine at the 0.05 level but the impact of intensity of use was much stronger. For cocaine, the greatest R^2 change occurred between steps 3 and 4 with the addition of intensity of use.

In all five sets of equations summarised in table 5.25, the beta weights for intensity of use decreased slightly in step 5 when the functions items were added. This suggests that a small proportion of the variance in problem scores explained by intensity of use was also accounted for by functions. In particular, despite a strong bivariate correlation, and significance at the p<0.01 level in step 4, current intensity of use did not attain significance in the final equation for amphetamines, suggesting that its apparent association with problem scores was accounted for by other variables measured.

Table 5.25 Summary of standard multiple regressions modelling problem scores (continued overleaf)

	Alcohol (ß) (n=312)						*Cannabis (ß) (n=345)*					
IVs	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Age	0.029	0.058	0.057	0.025	0.091*	0.073	-0.032	0.001	0.014	0.016	0.035	0.007
Gender	0.030	0.052	0.044	0.097	0.031	0.025	-0.107*	-0.090	-0.086	-0.057	-0.065	-0.020
Age of first use		-0.155**	-0.148*	-0.078	-0.012	-0.008		-0.107	-0.102	-0.011	-0.021	-0.023
Extent of peer use			0.043	-0.017	0.018	0.026			0.129*	0.085	0.088	0.093*
Partner/best friend's use			0.020	0.006	-0.014	-0.012			-0.049	-0.051	-0.070	-0.050
Intensity of use				0.389***	0.150**	0.136**				0.278***	0.158**	0.209***
NMF scale					0.452***	0.379***					0.357***	0.276***
SF scale					0.155**	0.119*					0.065	0.067
To enhance sex					-0.090*	-0.095*					0.053	0.037
To get intoxicated					0.086	0.084					0.062	0.077
To feel elated/euphoric					-0.001	0.001					0.104*	0.111*
To relax					0.067	0.052					-0.071	-0.064
To help stay awake					-0.025	-0.014					-0.043	-0.030
To help sleep/lose weight					0.058	0.075					0.041	0.000
To help work					-0.048	-0.058					0.043	0.031
To improve drug effects					0.045	0.036					0.036	0.027
To ease after effects					0.071	0.083					0.007	-0.019
Negative effects						0.168***						0.294***
R^2	0.002	0.024	0.027	0.165***	0.515***	0.532***	0.012	0.022	0.040*	0.104***	0.321***	0.392***
R^2 *change*		0.022	0.003	0.138	0.350	0.017		0.010	0.018	0.066	0.217	0.071

** $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$*

Table 5.25 Summary of standard multiple regressions modelling problem scores (continued overleaf)

	Amphetamines (β) (n=165)						*Ecstasy (β) (n=166)*					
IVs	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Age	-0.129	-0.075	-0.072	-0.035	-0.057	-0.036	-0.049	0.128	0.124	0.100	0.158*	0.146*
Gender	0.025	0.037	0.039	0.015	-0.018	0.022	0.072	0.068	0.055	0.083	0.061	0.056
Age of first use		-0.130	-0.102	-0.074	0.023	0.042		-0.364***	-0.295***	-0.167*	-0.104	-0.106
Extent of peer use			0.206*	0.133	0.026	0.000			0.206**	0.126	0.103	0.113
Partner/best friend's use			-0.013	-0.008	0.046	0.059			0.083	0.014	0.017	0.023
Intensity of use				0.231**	0.125	0.135				0.409***	0.324***	0.310***
NMF scale					0.153	0.158					0.185*	0.128
SF scale					0.287**	0.264**					0.229*	0.163
To enhance sex					-0.026	-0.061					0.034	0.026
To get intoxicated					0.017	-0.006					0.011	0.019
To feel elated/euphoric					0.044	0.029					-0.050	-0.026
To relax					-0.056	-0.041					-0.141*	-0.137*
To help stay awake					-0.025	-0.037					-0.060	-0.091
To help sleep/lose weight					0.085	0.023					0.167*	0.109
To help work					0.090	0.084					0.039	0.056
To improve drug effects					0.148*	0.111					0.112	0.104
To ease after effects					0.149	0.168*					-0.117	-0.086
Negative effects						0.245***						0.280***
R^2	0.017	0.031	0.071*	0.115**	0.332***	0.380***	0.009	0.110***	0.166***	0.297***	0.449***	0.508***
R^2 *change*		0.014	0.040	0.044	0.217	0.048		0.101	0.056	0.131	0.152	0.059

*$p < 0.05$; **$p < 0.01$; *** $p < 0.001$

Table 5.25 Summary of standard multiple regressions modelling problem scores (continued)

	Cocaine (ß) (n=172)					
IVs	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Age	-0.209**	0.059	0.030	0.053	0.044	0.008
Gender	-0.036	-0.015	-0.027	-0.005	-0.023	0.006
Age of first use		-0.418***	-0.313**	-0.033	-0.019	0.010
Extent of peer use			0.234**	0.040	-0.003	-0.004
Partner/best friend's use			-0.021	-0.012	-0.053	-0.013
Intensity of use				0.629***	0.439***	0.369***
NMF scale					0.241**	0.172*
SF scale					0.106	0.086
To enhance sex					0.137*	0.111
To get intoxicated					0.015	0.048
To feel elated/euphoric					0.100	0.076
To relax					-0.117	-0.087
To help stay awake					-0.113	-0.107
To help sleep/lose weight					-0.001	-0.046
To help work					0.030	0.057
To improve drug effects					-0.035	-0.024
To ease after effects					0.186**	0.127*
Negative effects						0.297***
R^2	0.042*	0.146***	0.190***	0.420***	0.566***	0.622***
R^2 *change*		0.104	0.044	0.230	0.146	0.056

** $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$*

Although strongly significant (p<0.001) for all drugs, the addition of the variable for negative effects had a relatively small impact on the overall variance explained in the regression equations (average R^2 change=0.052).

The equation predicting amphetamine-related problems was unique in that SF scores were strong predictors (p<0.001). This variable was significant in the step 5 equation for ecstasy, but the addition of the negative effects variable in step 6 reduced the beta weight to 0.163, rendering it non-significant. The only other substance for which this variable reached significance was alcohol (p<0.05). Using alcohol *"to enhance sex"*, cannabis *"to feel elated"*, amphetamines and cocaine *"to ease after effects"* from other drugs, and using ecstasy *"to relax"* were all weak predictors of problems relating to these particular substances. None of the other function variables reached statistical significance in the complete regression equations.

None of the peer use variables made significant contributions to any of the complete equations, with the exception of a minor effect for cannabis (β=0.093, p<0.05).

Relationship between age of first use and problems

Age of first use did not make a significant contribution to any of the equations for problem scores, despite being significantly correlated with the dependent variables at a bivariate level. In the equations for ecstasy and cocaine the addition of age of first use (step 2) explained an extra 10% of the variance in problem scores over and above the proportion explained by demographics. However, the apparent relationship between this variable and the DV was explained by other variables in the final regression equations (step 6). This variable also contributed significantly to the equation for alcohol problem scores in steps 2 and 3 (when age, gender and peer use were controlled) but the relationship was reduced with the addition of the variable for intensity of use.

In order to explore the relationship between age of first use and problem scores for the five substances more fully, a series of additional regressions were conducted following the guidelines for mediator analyses described by Baron & Kenny (1986) (see analysis section 5.2.6 for more detail). The results from these regressions indicated that the effect of age of first use on problem scores was mediated by intensity of use as the association between these two variables was reduced to non-significance when intensity of use was controlled. In short, these findings indicate that the apparent relationship

between age of first use and problems was explained by variance in intensity of use for all drugs. Figures 5.7 to 5.11 illustrate the results from these regression analyses.

Figure 5.7 Intensity of use as a mediator of the relationship between age of first use and problem scores for alcohol

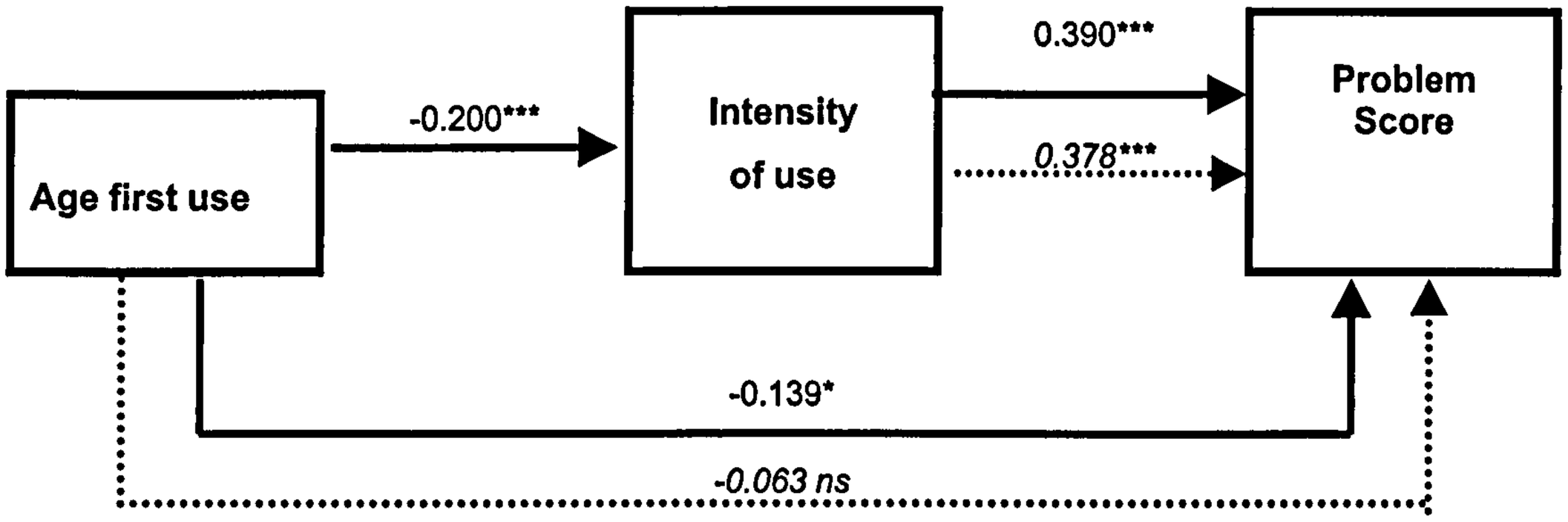
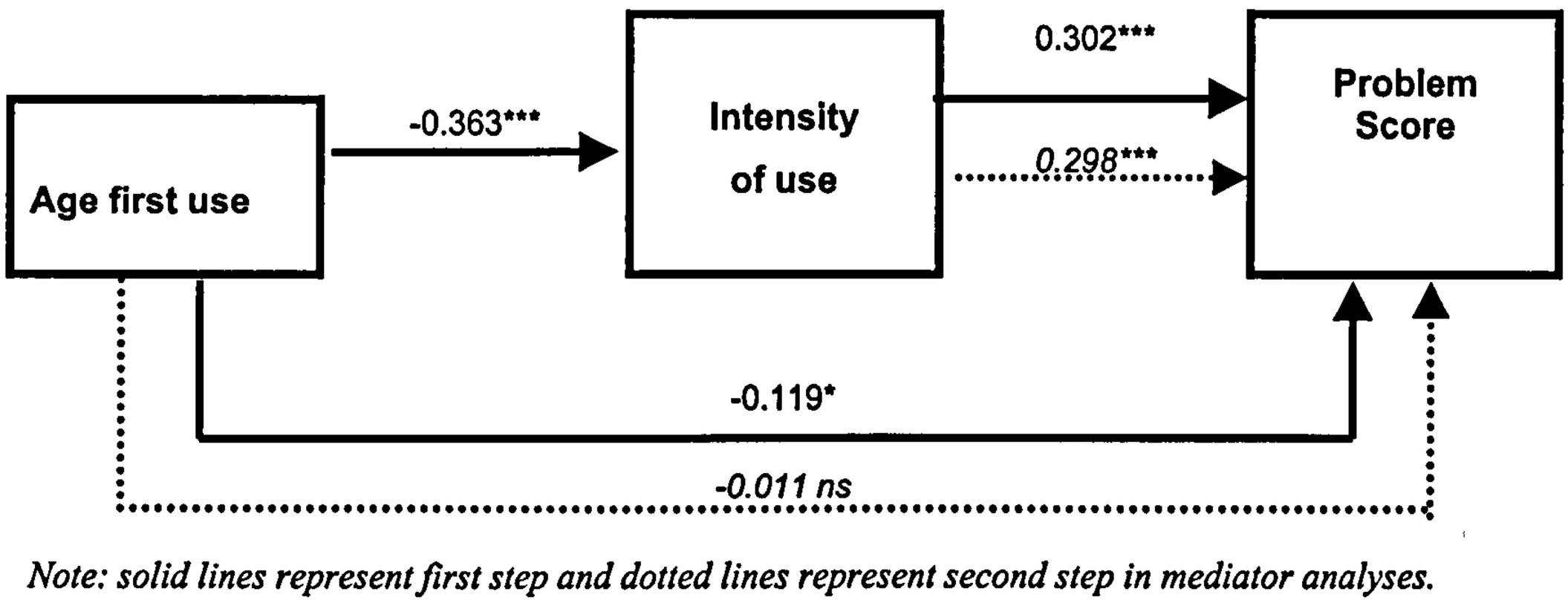


Figure 5.8 Intensity of use as a mediator of the relationship between age of first use and problem scores for cannabis



Note: solid lines represent first step and dotted lines represent second step in mediator analyses.

Figure 5.9 Intensity of use as a mediator of the relationship between age of first use and problem scores for amphetamines

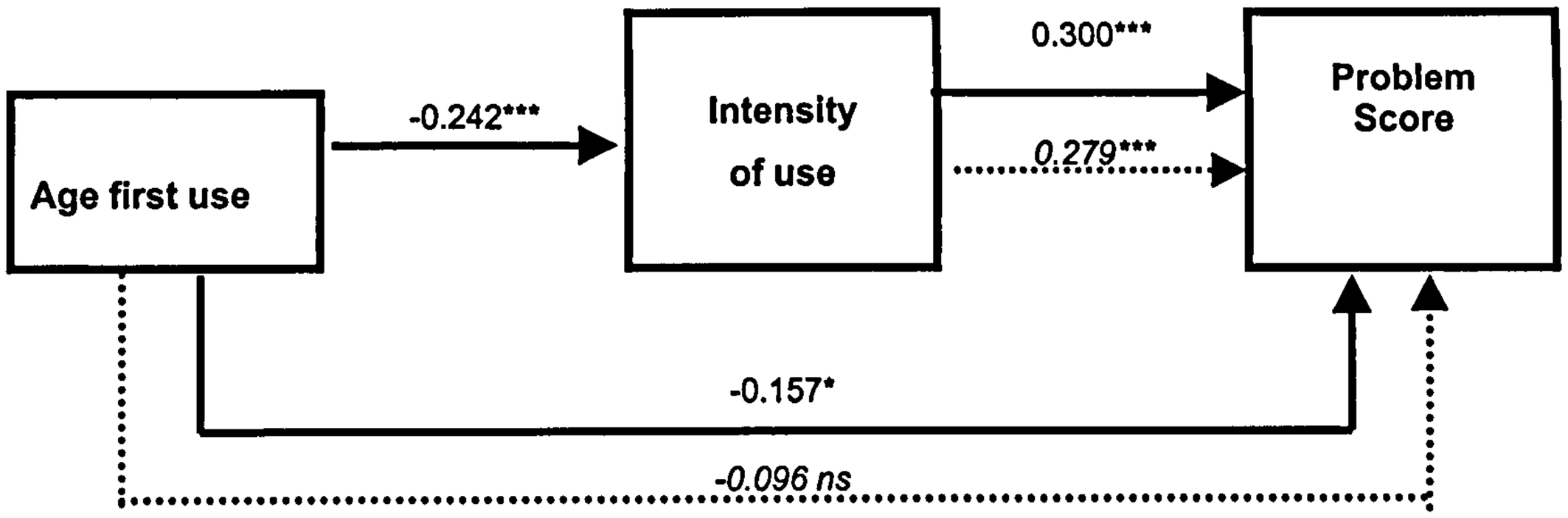


Figure 5.10 Intensity of use as a mediator of the relationship between age of first use and problem scores for ecstasy

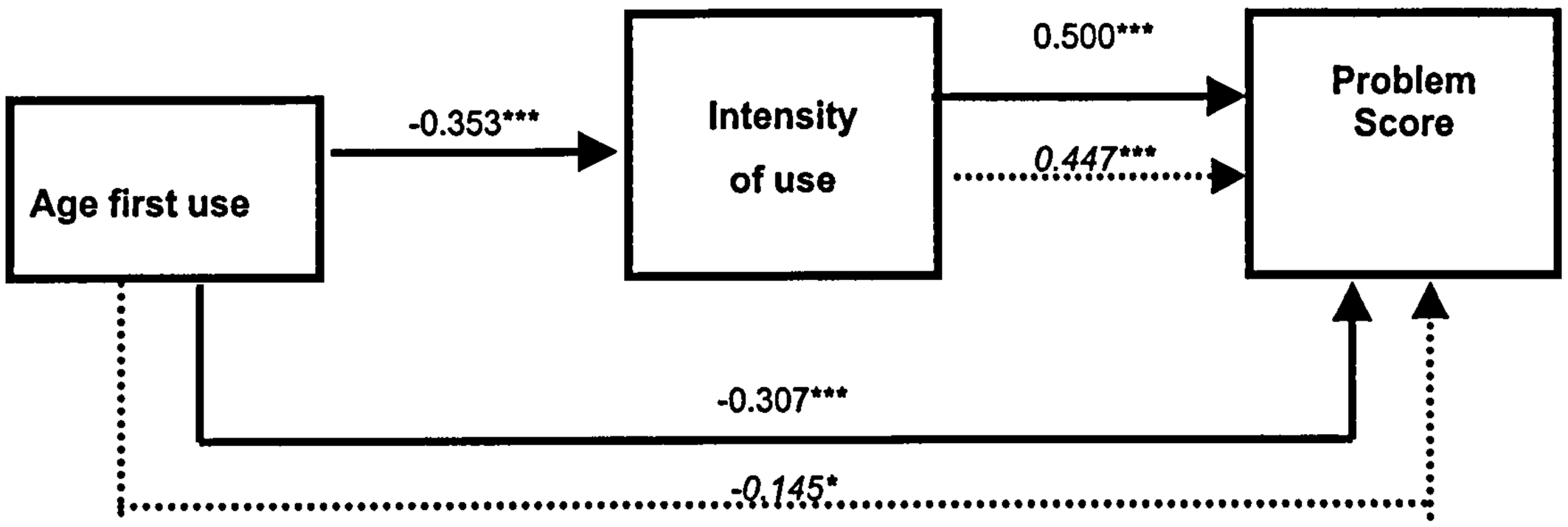
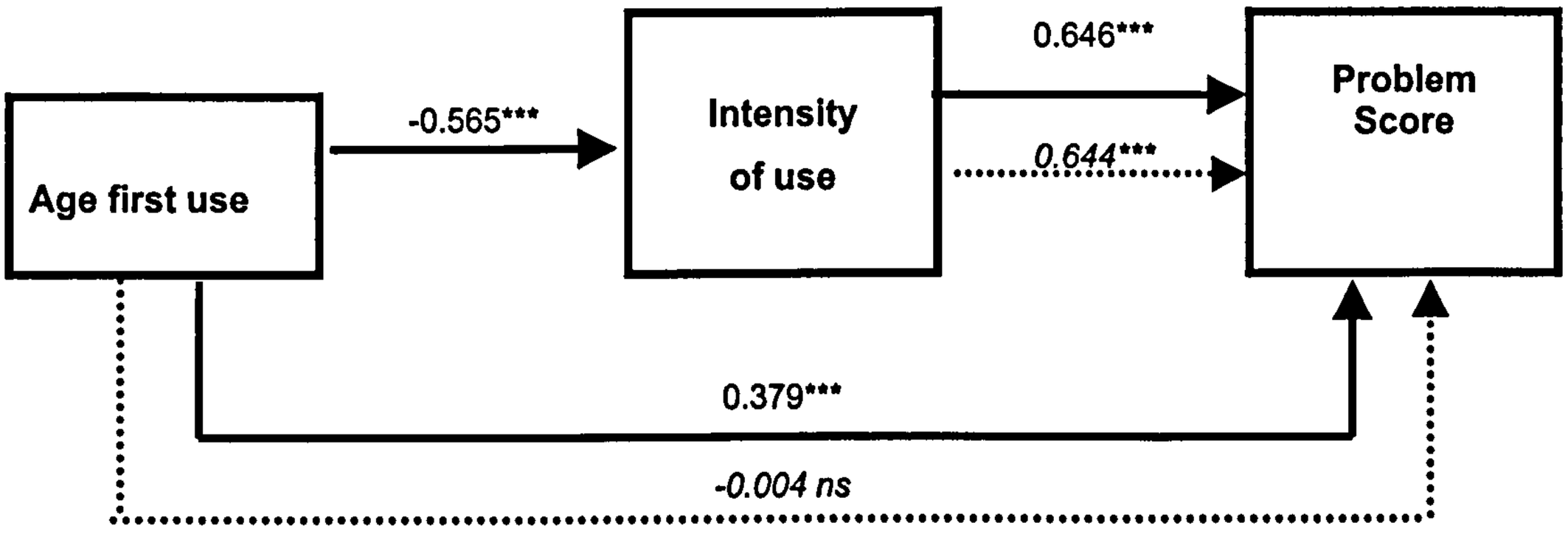


Figure 5.11 Intensity of use as a mediator of the relationship between age of first use and problem scores for cocaine



Note: solid lines represent first step and dotted lines represent second step in mediator analyses.

Interaction effects

The next stage in the analyses examined evidence for moderating effects of age and gender on each of the independent variables. One hundred and sixty further regressions were conducted, the results of which provided evidence for 18 possible interactions. These are summarised in the following table:

Table 5.26 Potential interaction terms for problem score models

Drug	*Interaction*
Cannabis:	age x SF scale age x using *"to improve effects"* of other drugs
Amphetamines:	age x NMF scale age x using *"to improve effects"* of other drugs age x using *"to ease after effects"* of other drugs gender x using *"to ease after effects"* of other drugs gender x intensity of recent use
Ecstasy:	gender x NMF scale age x negative effects
Cocaine:	age x using *"to enhance sex"*
Alcohol:	age x NMF scale age x SF scale age x using *"to enhance sex"* age x using *"to get intoxicated"* age x using *"to improve effects"* of other drugs gender x using *"to improve effects"* of other drugs age x negative effects age x intensity of recent use.

Final regressions on problem scores

The regression equations were then re-run with the addition of these interaction terms using backwards elimination. The results from this second set of equations are presented in table 5.27. The proportion of variance in problem scores explained ranged between 39% (37% adjusted) for cannabis and 61% (59% adjusted) for cocaine. R^2 was significantly different from zero in all of the equations (alcohol: $F_{[13,298]}=26.9$, $p<0.001$; cannabis: $F_{[9,335]}=23.3$, $p<0.001$; amphetamines: $F_{[13,151]}=9.54$, $p<0.001$; ecstasy: $F_{[12,153]}=14.4$, $p<0.001$; cocaine: $F_{[9,162]}=28.1$, $p<0.001$). Gender and age were controlled in all equations.

Table 5.27 Final regressions modelling problem scores

	Alcohol (n=312)	Cannabis (n=345)	Amphetamines (n=165)	Ecstasy (n=166)	Cocaine (n=172)
IVs	*β*	*β*	*β*	*β*	*β*
Age	-0.199	-0.119	0.028	0.247**	-0.071
Gender	0.027	-0.025	-0.298*	-0.058	-0.018
Age of first use	-	-	-	-	-
Extent of peer use	-	-	-	0.163**	-
Partner/best friend's use	-	-	-	-	-
Current intensity of use	-0.947*	0.227***	-0.386*	0.318***	0.348***
Gender x intensity of use	-	-	0.667**	-	-
Age x intensity of use	1.12*	-	-	-	-
NMF scale	0.372***	0.278***	-1.17	-0.224	0.131*
Gender x NMF scale	-	-	-	0.425*	-
Age x NMF scale	-	-	1.32*	-	-
SF scale	-	-	0.216**	-	-
To enhance sex	-0.104*	-	-	-	-
To get intoxicated	-	-	-	-	-
To feel elated/euphoric	-	0.118*	-	-	-
To relax	-	-	-	-	-
To help stay awake	-	-	-	-	-
To help sleep/lose weight	-	-	-	-	-
To help work	-	-	-	-	-
To improve drug effects	-	-	-	0.136*	-
To ease after effects	0.108*	-	2.28**	-	0.150**
Gender x ease after effect	-	-	-0.374*	-	-
Age x ease after effects	-	-	-1.74*	-	-
Negative effects	0.166***	0.302***	0.203**	1.67**	0.286***
Age x negative effects	-	-	-	-1.40**	-
R^2	**0.540**	**0.385**	**0.451**	**0.531**	**0.610**
Intercept (Adjusted R^2)	**12.3 (0.520)**	**6.65 (0.369)**	**6.14 (0.404)**	**-12.9 (0.495)**	**3.72 (0.588)**

** $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$*

As in the earlier equations, the three strongest predictor variables across all five substances were NMF scores, current intensity of use and negative effects associated with use in the past year. The addition of interaction terms to the equations resulted in significant relationships between NMF scores and problems scores in the equations for amphetamines and ecstasy becoming apparent in addition to the equations for alcohol, cannabis and cocaine (the initial regressions for problem scores showed a significant relationship between NMF scores and the DV for these latter drugs – see p.229). In the equations for amphetamines and ecstasy, NMF scores were found to interact with age and gender respectively. The nature of this interaction (and others in the equations) was examined using methods described in section 5.3.4.1 on p.222. Figure 5.12 shows that higher NMF scores were associated with higher problem scores in older amphetamine users. In contrast, there was a very weak negative association between these two variables at 16 years.

For ecstasy, the relationship between NMF scores and problems was much stronger in female users than their male counterparts (see figure 5.13).

As in the earlier set of equations, current intensity of use was a consistently strong predictor of problems relating to all five substances. In the equation for amphetamine problems, this variable interacted with gender (see figure 5.14). Here, female users who reported more intensive recent use tended to have higher problem scores than males using at equivalent levels. In contrast, female users who reported a low intensity of recent amphetamine use tended to have lower problem scores than males who were using at a similar level.

In the equation for alcohol problems, intensity of use also interacted with age. Figure 5.15 shows that this variable appeared to have a stronger association with problem scores in older drinkers and a weak negative one in younger users.

In addition to the consistent positive association between recent negative effects and problem scores for all five drugs, which was identified earlier, negative effects interacted with age in the equation for ecstasy-related problems. Figure 5.16 shows that the relationship between negative effects and problem scores was stronger in younger ecstasy users. However, older users who reported no negative effects from ecstasy use tended to score slightly higher on the problem scale than younger users with similar negative effects scores.

The contributions to the five equations from SF scores and single function items were broadly similar to those described in the first sets of equations for problem scores

(see table 5.25). However, the addition of interaction terms revealed further detail on the nature of the association between using *"to ease after effects"* from other drugs and amphetamine problem scores. This function interacted with both age and gender in this equation. Figures 5.17 and 5.18 show the relative contribution of the two variables. As can be seen, more frequent use of amphetamines for this function was related to higher problem scores in younger users. In contrast, the frequency of using amphetamines for this function had a less dramatic impact on problem scores in those aged 22 years. In addition to this interaction, the frequency of using amphetamines *"to ease after effects"* was found to relate much more strongly to problem scores in male users than female users (see figure 5.18).

Finally, two additional variables (age and the extent of peer use) made a significant contribution to just one of the regression equations. Higher ecstasy-related problem scores were associated with older users and predicted by reports of having a greater proportion of ecstasy-using peers (both at the $p<0.01$ level).

Figure 5.12 NMF interaction with age for amphetamine problem scores

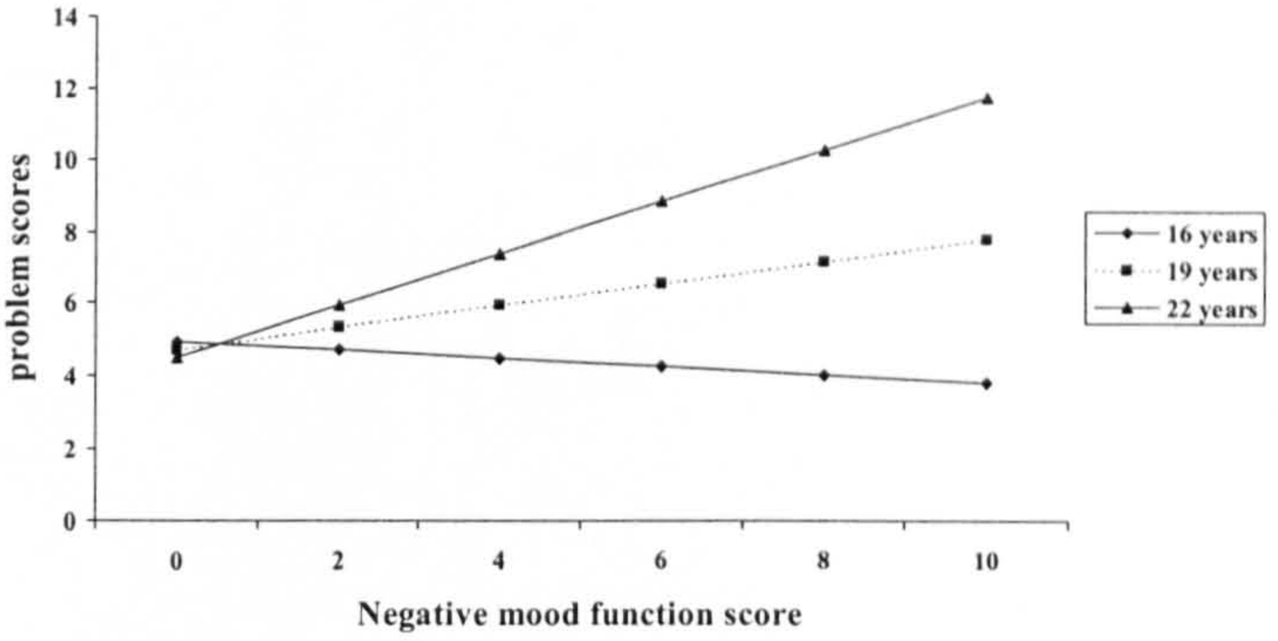


Figure 5.13 NMF interaction with gender for ecstasy problem scores

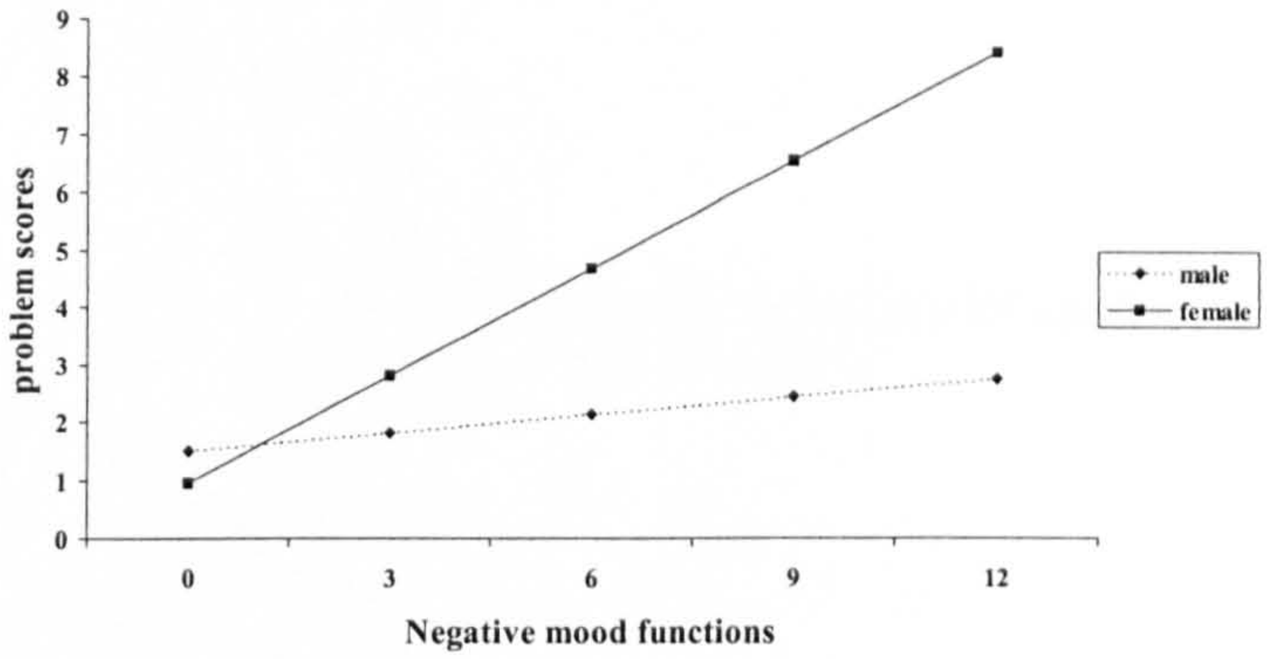


Figure 5.14 Intensity of use interaction with gender for amphetamine problem scores

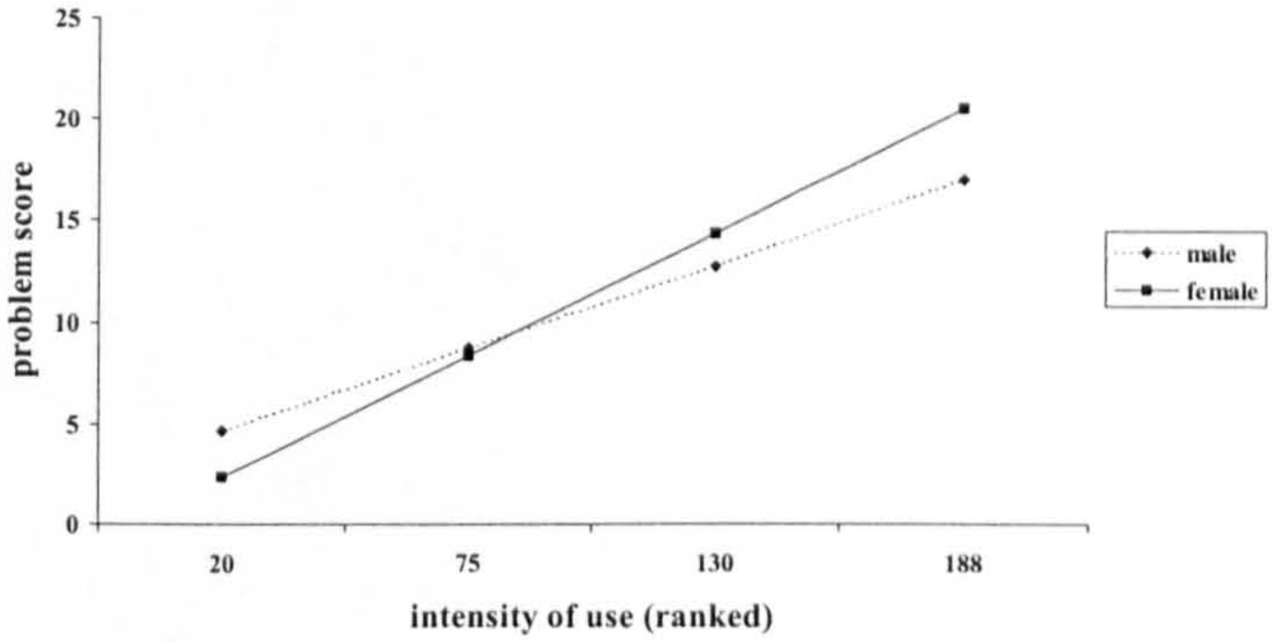


Figure 5.15 Intensity of use interaction with age for alcohol problem scores

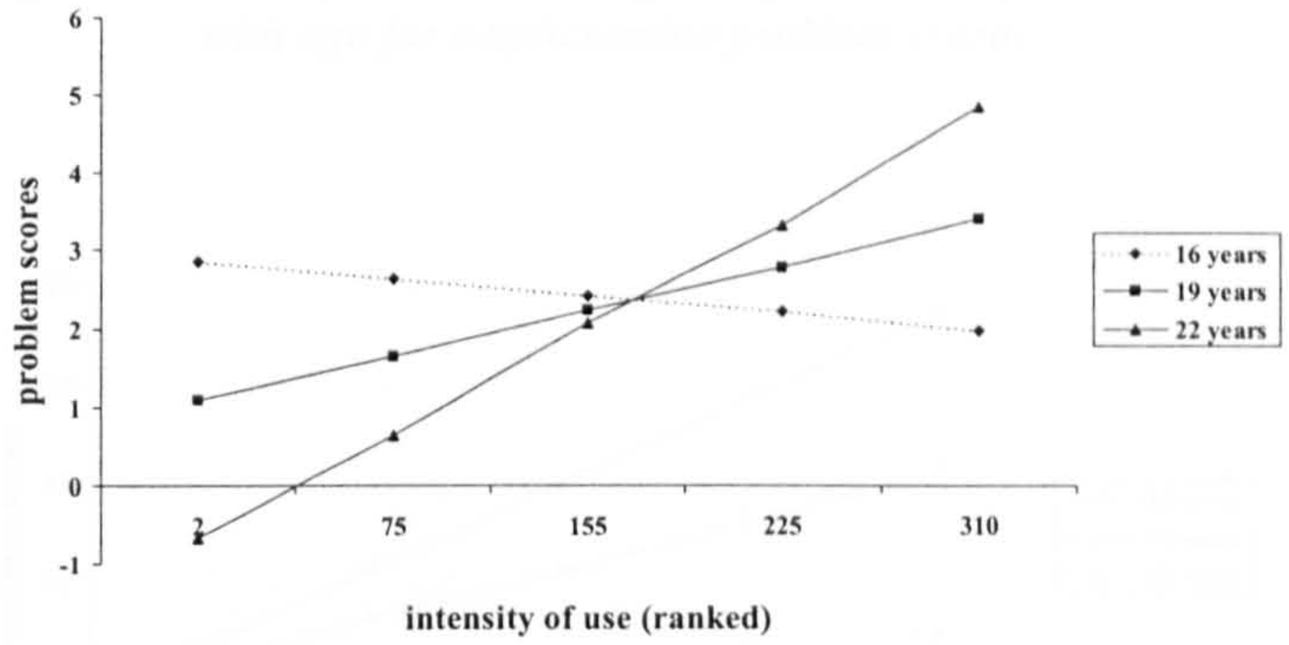


Figure 5.16 Negative effects interaction with age for ecstasy problem scores

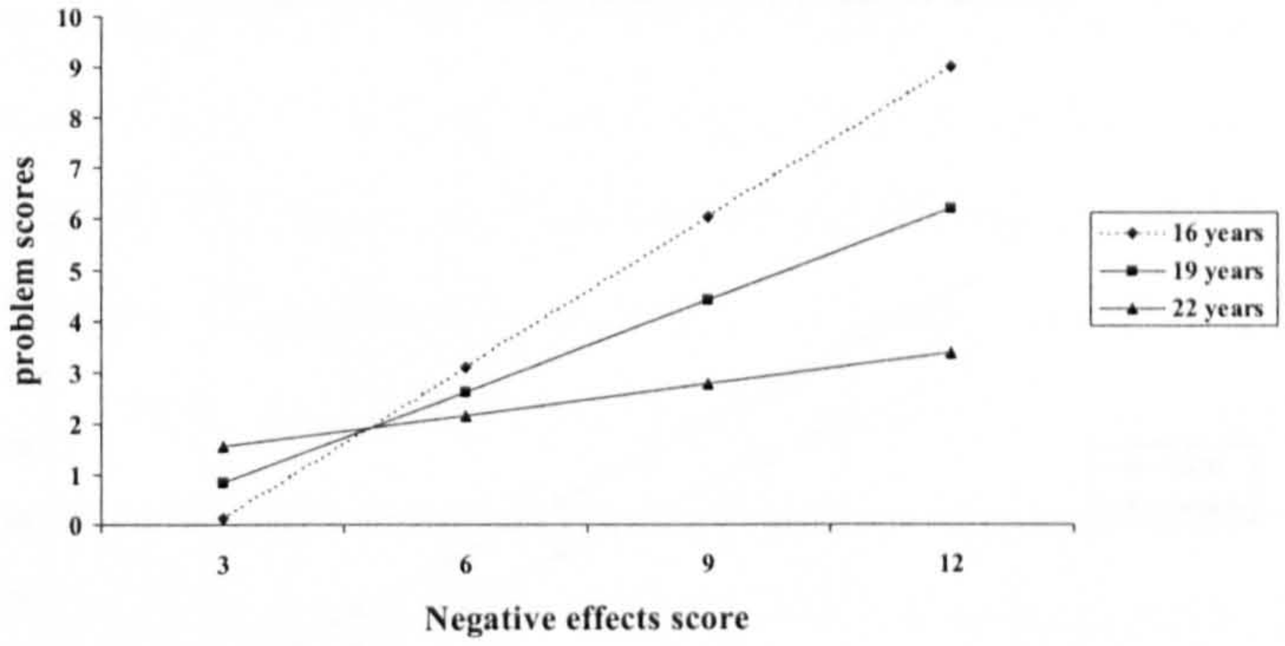


Figure 5.17 Using to ease after effects of other drugs interaction with age for amphetamine problem scores

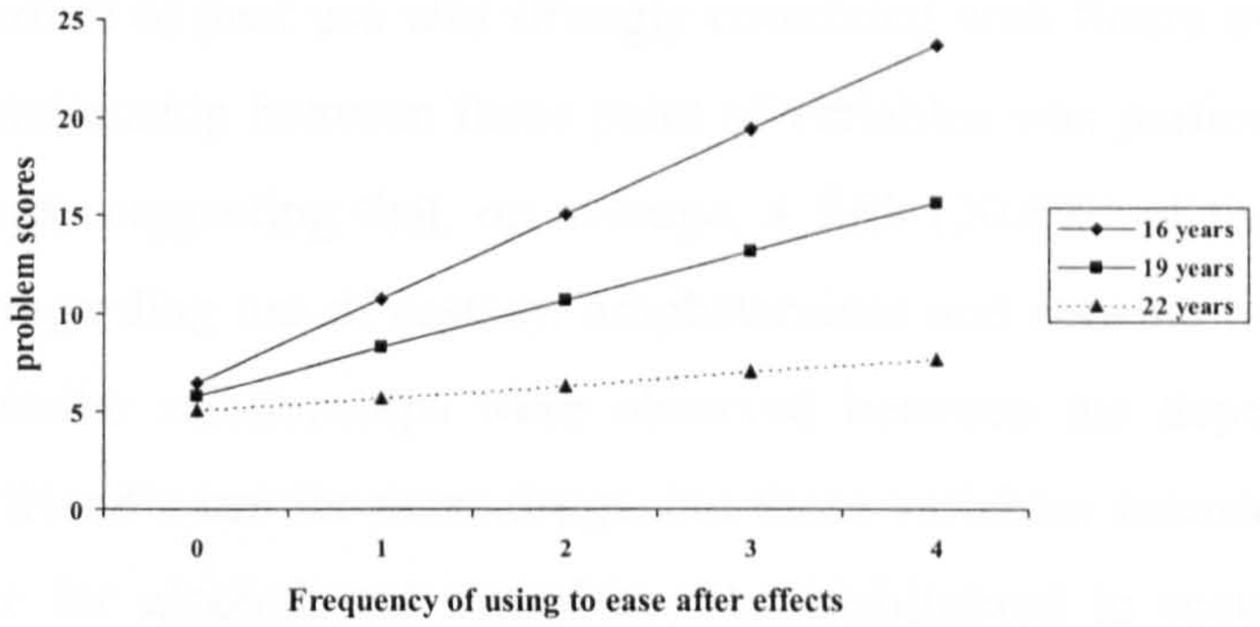
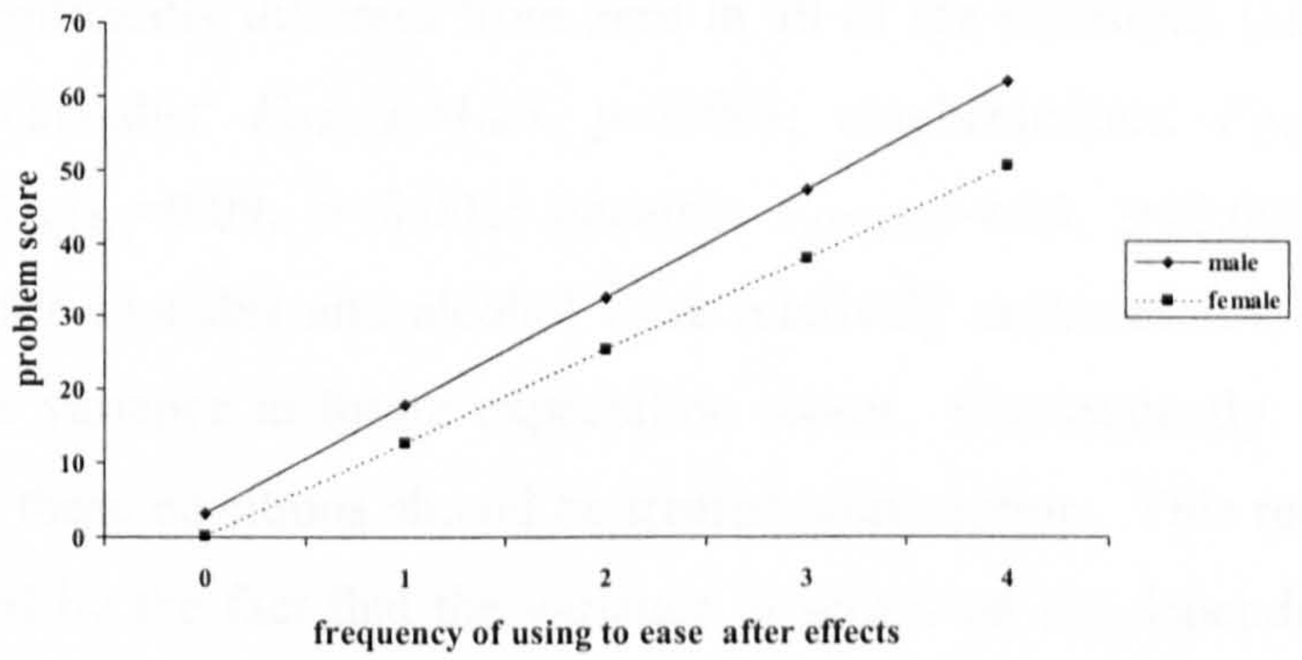


Figure 5.18 Using to ease after effects of other drugs interaction with gender for amphetamine problem scores



5.3.4.3 Modelling future expectations

Once again the same analytical sequence to that described previously for modelling intensity of use and problem scores (see sections 5.3.4.1 and 5.3.4.2) was used to examine variables associated with future expectations for each of the drugs. First of all, the same 18 predictor variables used to model problem scores were entered into five sequential multiple regression equations in six blocks using future expectation scores as the DV. Table 5.28 summarises Pearson's correlations between the DV and IVs for each substance.

The extent of peer use was strongly correlated with future expectations for each drug. The relationship between these pairs of variables was particularly strong for the stimulant drugs, suggesting that, on average, a fifth (20.8%) of the variance in future expectations regarding use of ecstasy, amphetamines and cocaine was accounted for by peer use. Similar relationships were observed between the dependent variable and partner/ best friend's use for these drugs, but these variables seemed to be independent of each other for alcohol and cannabis. As highlighted in section 5.3.3.5, current intensity of use was highly correlated with future expectations for all five drugs. The extent of using a drug *"to get intoxicated"* in the past year was significantly correlated with future expectations for all drugs except cocaine. In contrast to the earlier sets of dependent variables (intensity of use and problem scores), NMF and SF scores were only significantly related to future use expectations for ecstasy and cocaine use.

The results from the regressions are summarised in table 5.29. The proportion of variance in future expectation scores predicted by the 18 independent variables ranged between 19% (15% adjusted) for cannabis and 53% (47% adjusted) for ecstasy. R^2 was significantly different from zero in all of the equations (alcohol: $F_{[18,293]}$=5.21, p<0.001; cannabis: $F_{[18,326]}$=4.28, p<0.001; amphetamines: $F_{[18,146]}$=6.43, p<0.001; ecstasy: $F_{[18,147]}$=9.09, p<0.001; cocaine: $F_{[18,153]}$=4.64, p<0.001). The regression equations for cannabis and alcohol were relatively unsuccessful, explaining less than 25% of the variance in future expectation scores. Consequently, interpretation of the solution to these equations should be treated with caution. This result is likely to have been caused by the fact that the variance in scores on the dependent variable in these two equations was much more uneven than for the stimulant drugs with the majority of users scoring 'six' or 'seven', thus indicating that it was highly likely that they would use these substances again in the next 12 months. These results could also be explained

by other covariate influences acting on the dependent variables, which could not be adequately controlled for in the analyses.

Table 5.28 Pearson's correlations between independent variables and future expectations

IVs	Alcohol (n=312)	Cannabis (n=345)	Amphetamines (n=165)	Ecstasy (n=166)	Cocaine (n=172)
Age	0.000	-0.085	-0.128	-0.012	-0.221**
Gender	0.007	0.088	0.144*	0.084	0.077
Age of first use	0.011	-0.189***	-0.121	-0.146	-0.310***
Extent of peer use	0.267***	0.204***	0.483***	0.460***	0.424***
Partner/best friend's use	0.051	0.097	0.404***	0.512***	0.285***
Current intensity of use	0.255***	0.318***	0.517***	0.496***	0.553***
NMF scale	-0.031	0.076	0.138	0.233**	0.250***
SF scale	0.110	0.080	-0.149	0.259***	0.231**
To enhance sex	-0.042	0.069	0.029	0.143	0.258***
To get intoxicated	0.197***	0.261***	0.311***	0.336***	0.125
To feel elated/euphoric	0.085	-0.051	0.123	0.298***	0.100
To relax	0.135*	0.110*	0.076	0.194*	-0.079
To help stay awake	0.088	0.044	0.300***	0.280***	0.179*
To help sleep/lose weight	0.006	0.103	0.108	0.064	0.078
To help work	-0.118*	0.018	0.003	0.008	0.002
To improve drug effects	0.022	0.081	0.155*	0.048	-0.053
To ease after effects	0.004	0.154**	0.106	0.023	0.036
Negative effects	0.052	0.171***	0.017	-0.079	0.116

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table 5.29 Summary of standard multiple regressions modelling future expectations (continued overleaf)

	Alcohol (β) (n=312)						*Cannabis (β) (n=345)*					
IVs	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Age	-0.005	-0.005	-0.005	-0.024	-0.036	-0.042	-0.090	-0.030	-0.021	-0.019	-0.009	0.05
Gender	0.068	0.068	0.026	0.058	0.044	0.042	0.112*	0.143**	0.119*	0.142**	0.122*	0.099
Age of first use		-0.001	0.035	0.078	0.093	0.094		-0.191***	-0.167**	-0.096	-0.081	-0.080
Extent of peer use			0.270***	0.233***	0.207***	0.210***			0.163**	0.129*	0.114*	0.111*
Partner/best friend's use			0.057	0.048	0.040	0.041			0.082	0.080	0.056	0.046
Intensity of use				0.239***	0.235***	0.230***				0.217***	0.181**	0.155**
NMF scale					-0.200**	-0.224**					-0.069	-0.027
SF scale					0.123	0.111					0.060	0.059
To enhance sex					-0.087	-0.089					-0.028	-0.019
To get intoxicated					0.154*	0.153*					0.192***	0.185***
To feel elated/euphoric					0.021	0.022					-0.050	-0.053
To relax					0.113	0.108					-0.025	-0.028
To help stay awake					0.039	0.043					0.048	0.042
To help sleep/lose weight					-0.005	0.001					0.030	0.052
To help work					-0.120*	-0.123*					-0.017	-0.011
To improve effects					-0.030	-0.033					-0.034	-0.030
To ease after effects					-0.070	-0.066					0.105	0.118*
Negative effects						0.056						-0.151**
R^2	0.005	0.005	0.085***	0.137***	0.214***	0.216***	0.022*	0.055***	0.089***	0.128***	0.173***	0.191***
R^2 *change*		0.000	0.080	0.052	0.077	0.002		0.033	0.034	0.039	0.045	0.018

*$p < 0.05$; **$p < 0.01$; *** $p < 0.001$

Table 5.29 Summary of standard multiple regressions modelling future expectations (continued overleaf)

	Amphetamines (β) (n=165)						*Ecstasy (β) (n=166)*					
IVs	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Age	-0.074	-0.040	-0.044	-0.009	-0.025	-0.036	0.019	0.109	0.089	0.073	0.022	0.033
Gender	0.120	0.128	0.101	0.078	0.083	0.062	0.111	0.109	0.075	0.03	0.122	0.127*
Age of first use		-0.082	0.012	0.038	0.033	0.023		-0.187*	-0.024	0.058	0.004	0.006
Extent of peer use			0.448***	0.377***	0.362***	0.375***			0.285***	0.233***	0.169*	0.160*
Partner/best friend's use			0.252***	0.257***	0.248***	0.242***			0.368***	0.324***	0.264***	0.259***
Intensity of use				0.221**	0.198**	0.193*				0.265***	0.294***	0.307***
NMF scale					0.052	0.050					-0.005	0.047
SF scale					-0.009	0.002					0.004	0.065
To enhance sex					-0.145*	-0.127					-0.057	-0.049
To get intoxicated					0.039	0.051					0.174**	0.167**
To feel elated/euphoric					-0.006	0.002					0.255***	0.232***
To relax					0.027	0.019					0.029	0.025
To help stay awake					0.141	0.147*					0.078	0.107
To help sleep/lose weight					-0.003	0.029					-0.005	0.048
To help work					-0.007	-0.004					-0.022	-0.037
To improve effects					0.089	0.108					-0.027	-0.020
To ease after effects					-0.059	-0.068					-0.040	-0.068
Negative effects						-0.125						-0.258***
R^2	0.019	0.024	0.343***	0.383***	0.430***	0.442***	0.012	0.038	0.304***	0.359***	0.477***	0.527***
R^2 *change*		0.005	0.319	0.040	0.047	0.012		0.026	0.266	0.055	0.118	0.050

*$p < 0.05$; **$p < 0.01$; *** $p < 0.001$

Table 5.29 Summary of standard multiple regressions modelling future expectations (continued)

	Cocaine (ß) (n=172)					
IVs	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Age	-0.181*	0.029	-0.019	-0.005	-0.003	0.014
Gender	0.033	0.050	0.019	0.032	0.037	0.024
Age of first use		-0.328***	-0.165	0.001	-0.031	-0.044
Extent of peer use			0.320***	0.205**	0.193*	0.193*
Partner/best friend's use			0.092	0.098	0.113	0.095
Intensity of use				0.372***	0.396***	0.427***
NMF scale					-0.120	-0.088
SF scale					0.127	0.137
To enhance sex					0.085	0.097
To get intoxicated					0.025	0.010
To feel elated/euphoric					0.070	0.081
To relax					-0.177*	-0.190*
To help stay awake					-0.057	-0.060
To help sleep/lose weight					0.004	0.025
To help work					0.020	0.007
To improve drug effects					0.001	-0.004
To ease after effects					-0.069	-0.042
Negative effects						-0.136
R^2	0.036*	0.100***	0.208***	0.289***	0.341***	0.353***
R^2 *change*		0.064	0.108	0.081	0.052	0.012

** $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$*

Table 5.29 shows that the most consistent predictors of future expectations for all five substances were intensity of current use and extent of peer use. In addition to peer use, the current use of a partner or best friend also made a significant contribution to the equations for future use expectations for ecstasy and amphetamines ($p<0.001$). As in section 5.3.4.1, further regressions were conducted in which current peer use was omitted from the list of independent variables. Results suggested that for cocaine the relationship between partner/best friend's use and intensity was masked by the contribution to the equation made by current peer use. However, partner/best friend's use did not make a significant contribution to the equations for alcohol or cannabis.

For the three stimulant drugs (amphetamines, ecstasy and cocaine), the greatest change to R^2 occurred in step 3 with the introduction of the peer-use variables. For these three drugs, the average increase in R^2 was 0.231, indicating that between 11% (cocaine) and 32% (amphetamines) of the variance in future expectation scores was explained by peer use when age of first use, age and gender were controlled. In contrast, the contribution of peer use to the equations for cannabis and alcohol was much smaller (R^2 change = 0.080 for alcohol and 0.034 for cannabis).

Past year experience of negative effects was negatively associated with future expectations regarding the use of cannabis and ecstasy. This suggested that users who reported greater negative effects from each of these drugs in the past year reported less strong expectations that they would use again during the next year. Similar associations were observed between negative effects and future expectations for amphetamines and cocaine but the beta weights were not sufficiently large to reach statistical significance.

With the exception of ecstasy, the introduction of the function variables into the equations predicting future use expectations (step 5) had a much smaller impact than had been observed in the equations for intensity of use and problem scores. For ecstasy, the change in R^2 was similar to that observed in the equivalent step for the regression modelling intensity of ecstasy use.

Neither of the two NMF and SF subscales made significant contributions to the equations for cannabis, amphetamines, ecstasy or cocaine. Scores on the NMF scale were significant predictors of scores for future alcohol use. This association is examined in more detail later in this section.

Frequency of using a substance *"to get intoxicated"* predicted future use expectations in alcohol, cannabis and ecstasy. In order to examine whether the effect of certain function items on the dependent variable was masked by the influence of using

"to get intoxicated", the regressions were re-run without this function item. However, this did not result in any significant changes in the equations, indicating that this effect was not present.

Using *"to feel elated"* was also a strong predictor of ecstasy use, but was not associated with future use of any of the other four substances. In contrast, using cocaine *"to relax"* was a negative predictor of future use expectations regarding this drug. This indicates that people who had used cocaine for this function within the past year tended to report weaker expectations for future cocaine use than people who used cocaine for other functions.

Despite being strongly correlated with future expectations for all three of the stimulant drugs, using *"to stay awake"* only reached significance in the equation for amphetamines ($p<0.05$). This suggests that the apparent relationship between these variables for ecstasy and cocaine was explained by variation in other covariates in these equations. Finally, frequency of using cannabis in order *"to ease after effects"* from other drugs predicted future use. This variable was not a significant predictor in any of the other equations for any of the other drugs.

<u>Interaction effects</u>

Further regressions were conducted in which the potential moderating effects of age and gender on each of the independent variables were explored. The results of these regressions provided evidence for five interactions with gender but none with age. There was evidence that gender interacted with negative effects in influencing future cannabis use expectations, with using *"to stay awake"* for cocaine expectations, with drinking *"to get intoxicated"*, negative effects and current intensity of use for alcohol.

Potential interactions between intensity of use and negative effects were also assessed. Results suggested a possible interaction between these variables for alcohol use. Further analyses revealed that this complex interaction was due to the quadratic effects of these two variables. The square of each of these variables was therefore entered into the final regression for alcohol.

Final regressions on future use expectations

The regression equations were then re-run using backwards elimination with the addition of the basic interaction and quadratic terms as described above. The results from this set of equations are presented in table 5.30. The proportion of explained variance in future use expectations ranged between 20% (18% adjusted) for cannabis and 46% (43% adjusted) for ecstasy. R^2 was significantly different from zero in all of the equations (alcohol: $F_{[10,301]}$=11.7, p<0.001; cannabis: $F_{[8,336]}$=10.4, p<0.001; amphetamines: $F_{[7,157]}$=15.1, p<0.001; ecstasy: $F_{[9,156]}$=14.6, p<0.001; cocaine: $F_{[9,162]}$=9.45, p<0.001). Gender and age were controlled for in all equations.

As was observed in the first set of equations for future use expectations, current intensity of use was a consistently strong predictor for all drugs with the exception of ecstasy. This variable interacted with gender in the equation for alcohol. The nature of this interaction and others in the equations were examined using methods described in on p.222. Female low-intensity drinkers tended to rate the likelihood of using alcohol in the next year slightly higher than males drinking at equivalent levels (see figure 5.19).

The extent of having experienced negative effects during the past year predicted future use of all drugs, with the exception of amphetamines. Negative effects scores were found to interact with gender in the equation for cannabis (see figure 5.20). The graph shows that higher negative effects were associated with lower future expectations of cannabis use in males, while this variable had little impact on future expectations in females.

Table 5.30 Final regressions modelling future expectations

	Alcohol (n=312)	Cannabis (n=345)	Amphet. (n=165)	Ecstasy (n=166)	Cocaine (n=172)
IVs	*β*	*β*	*β*	*β*	*β*
Age	-0.022	-0.033	-0.014	0.004	0.006
Gender	0.394***	-0.003	0.075	0.139*	-0.184
Age of first use	-	-	-	-	-
Extent of peer use	0.180***	0.123*	0.348***	0.168**	0.197**
Partner/best friend's use	-	-	0.258***	0.262***	-
Current intensity of use	1.502 ***	0.171**	0.220**	-	0.461***
Gender x intensity	-0.572***	-	-	-	-
Intensity quadratic	-0.760***	-	-	-	-
NMF scale	-0.220***	-	-	-	-
SF scale	0.153*	-	-	-	0.170*
To enhance sex	-	-	-	-	-
To get intoxicated	-	0.187***	-	0.177**	-
To feel elated/euphoric	-	-	-	0.303***	-
To relax	-	-	-	-	-0.192**
To help stay awake	-	-	0.164*	-	-0.551**
Gender x stay awake	-	-	-	-	0.586*
To help sleep/lose weight	-	-	-	-	-
To help work	-	-	-	-	-
To improve drug effects	-	-	-	-	-
To ease after effects	-	0.112*	-	-	-
Negative effects	0.635***	-0.443**	-	-0.194***	-0.151*
Gender x Neg. effects	-	0.307*	-	-	-
Neg. effects quadratic	-0.633***	-	-	-	-
R^2	0.279***	0.186***	0.416***	0.500***	0.353***
Intercept (Adjusted R^2)	2.24 (0.255)	5.92 (0.167)	1.22 (0.390)	1.63 (0.474)	4.17 (0.317)

The NMF scale was retained in the equation for alcohol, but this was not consistent with the equations for the other four drugs. As in the earlier equation predicting future alcohol use expectations (see table 5.29), this variable was a negative predictor of future expectations. Further analyses[1] were conducted to examine this effect more closely, as this relationship did not make sense intuitively. Results suggested that the relationship was strongly affected by a few outlying cases. These outlying cases should not be disregarded, but due to the fact that most cases scored 6 or 7 on the dependent variable (as mentioned earlier) their impact in the regression equation was unduly high.

Unlike the earlier equation, SF scores reached significance in the equation for alcohol indicating that people reporting greater frequency of using alcohol for social purposes tended to report it slightly more likely that they would use alcohol in the future. A similar effect was observed in the regression equation for cocaine.

As in the first set of equations modelling future expectations (see table 5.29), using with the purpose of becoming intoxicated significantly predicted future expectations for cannabis and ecstasy use but was dropped from the equation for alcohol use. Overall, the table summarising the final regressions shows similar results regarding the single function items to those obtained in the first set of regression equations. The addition of an interaction term between gender and using *"to stay awake"* revealed a significant association between these variables and future expectations regarding cocaine use, which had not been previously identified (see figure 5.21). This variable had a slight positive impact on future cocaine-use scores in females, but a negative impact on these scores in males.

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[1] By subtracting and adding variables systematically from the regression equation, it was revealed that the NMF score was strongly affected when the intensity of recent alcohol use was also entered as a covariate in the equation. Further investigations examined how NMF scores and future expectations varied at high, medium and low intensity of use among males and females. NMF was significantly correlated with future expectations at just one level of intensity for each gender (medium intensity for males and high intensity for females), which confirmed that the relationship between these variables was not consistent throughout the sample. A few erratic outliers were found to account for these inconsistencies: when four male respondents who reported high negative mood functions but low alcohol expectations were removed from the medium intensity of use cell, the correlation between NMF and future expectations was rendered non-significant. Similarly, when three female cases were removed from the high intensity cell the correlation dropped close to zero.

Figure 5.19 Intensity of use interaction with gender for alcohol future expectations

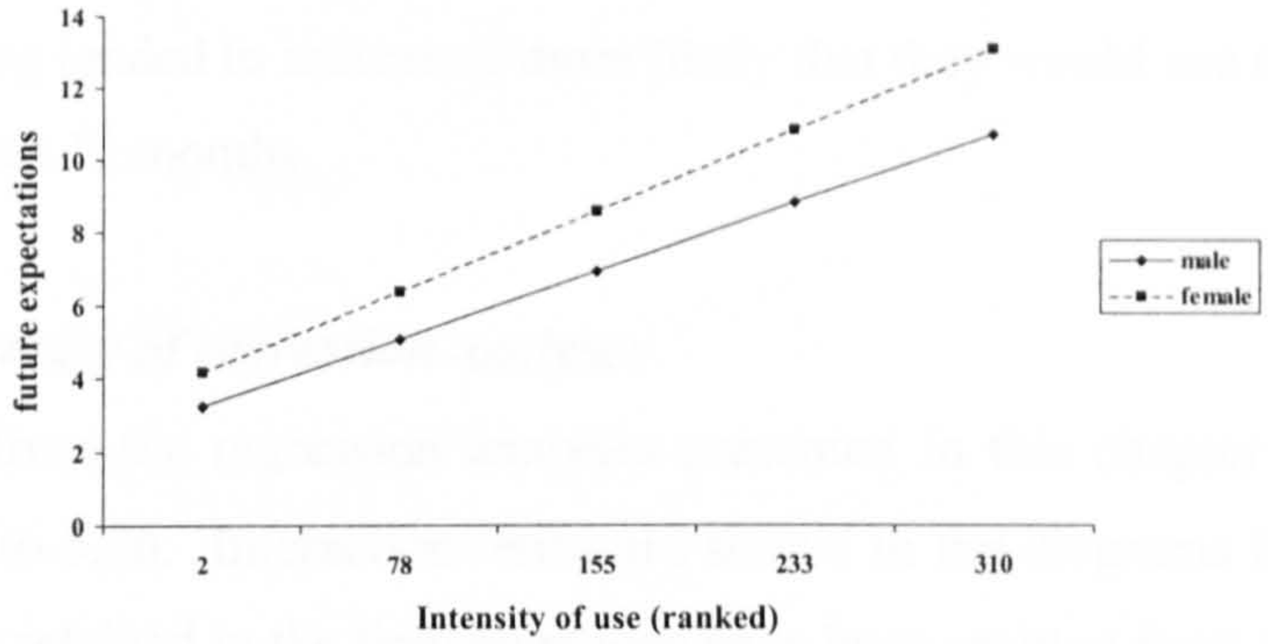


Figure 5.20 Negative effects interaction with gender for cannabis future expectations

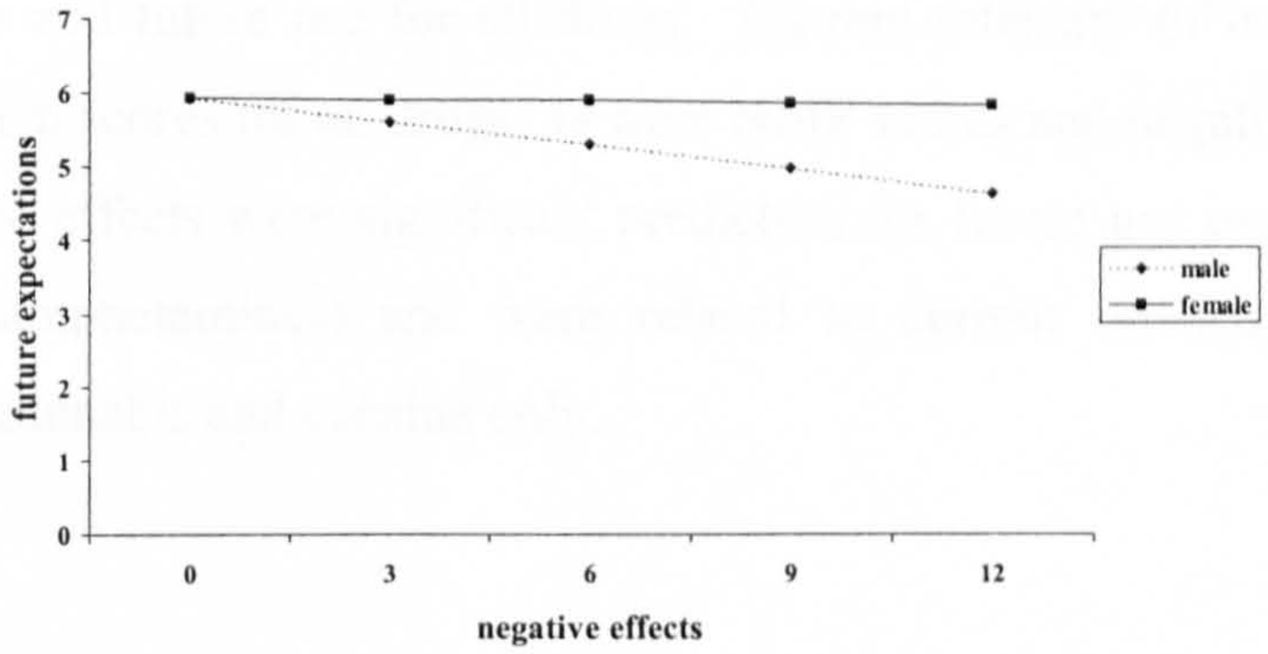
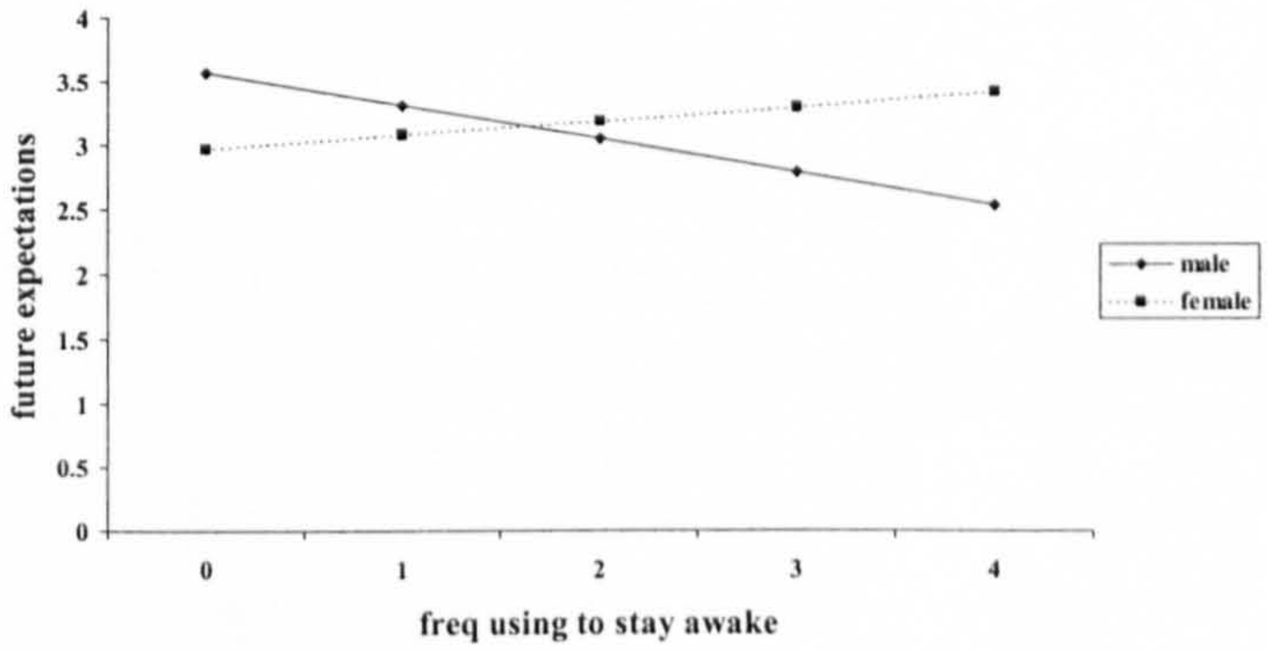


Figure 5.21 Using to stay awake interaction with gender for cocaine future expectations



Finally, as in the earlier regression equations, the perceived extent of peer use significantly predicted future use of all five substances and partner/best friend's use reached significance in the equations for amphetamines and ecstasy. These findings suggest that people who reported that a greater proportion of their friends were users of a specific drug tended to indicate it more likely that they would use this drug themselves within the next 12 months.

5.3.4.4 Summary of regression analyses

The results from the regression analyses presented in this chapter are summarised in figures 5.22 to 5.26. Interaction terms are shown in the diagrams in italics. Variables that were not retained in the final equations have been omitted from these diagrams.

Overall, a remarkable degree of consistency between drug types was observed in the models despite marked differences in their effects. Functions were found to play a significant role in all fifteen regression models. Peer use was a consistent predictor of intensity of use and future use for all drugs. Current intensity of use was positively related to problem scores for all drugs, as were NMF scores and negative effects scores. Finally, negative effects were significant predictors for future use expectations for all drugs (except amphetamines) and were related to current intensity of use in the regressions for cannabis and cocaine only.

Figure 5.22 Summary of significant variables in each of the alcohol regressions

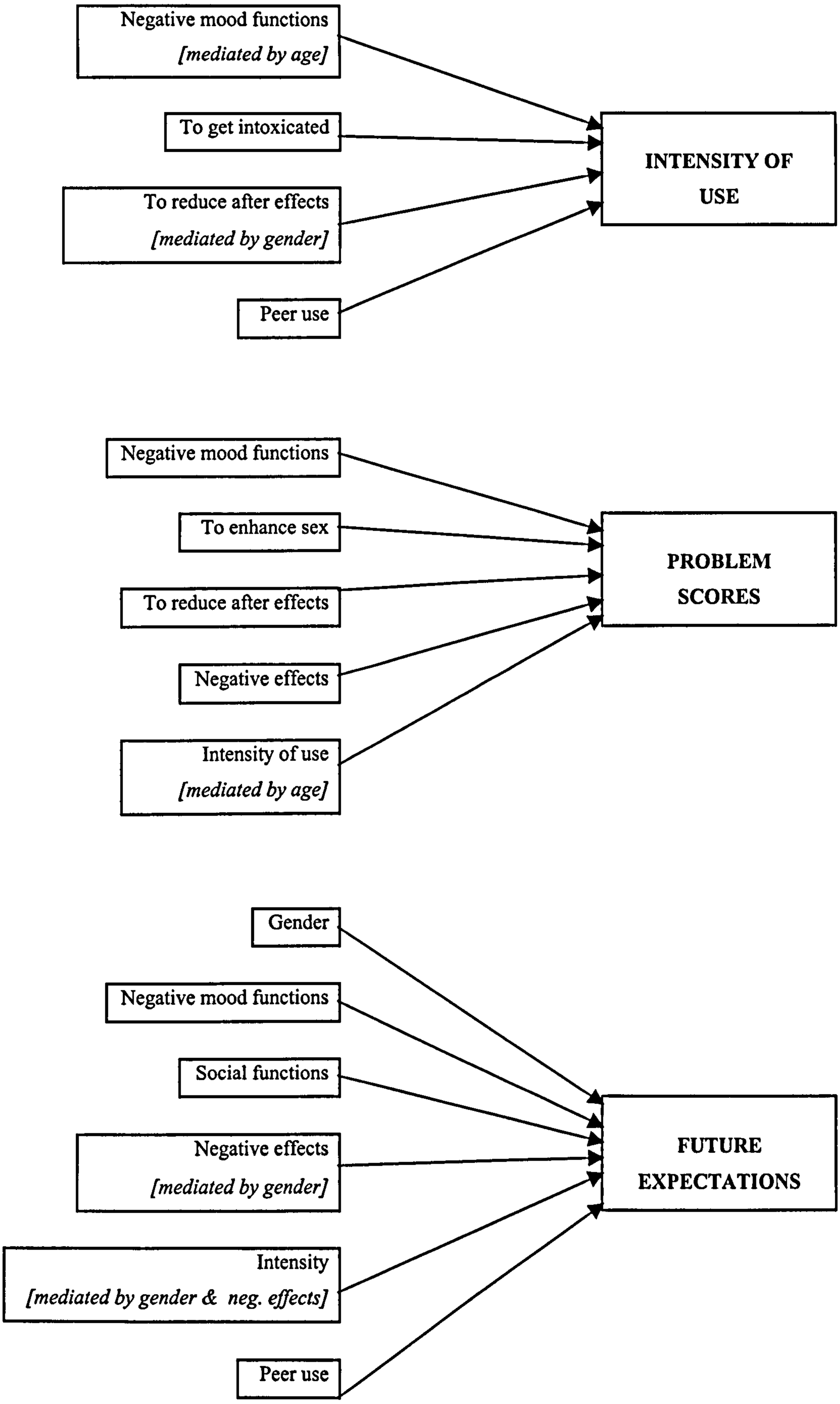


Figure 5.23 Summary of significant variables in each of the cannabis regressions

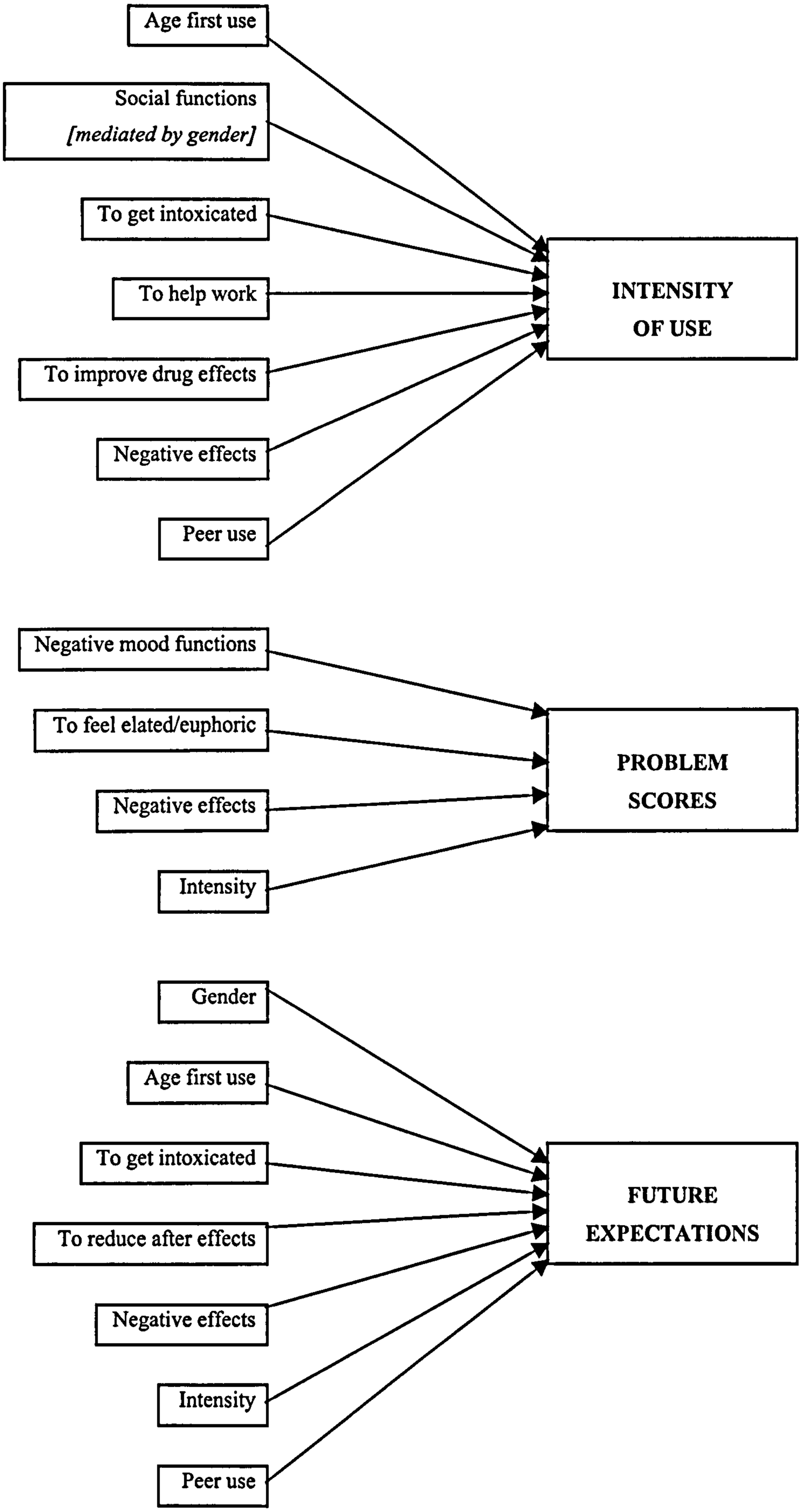


Figure 5.24 Summary of significant variables in each of the amphetamine regressions

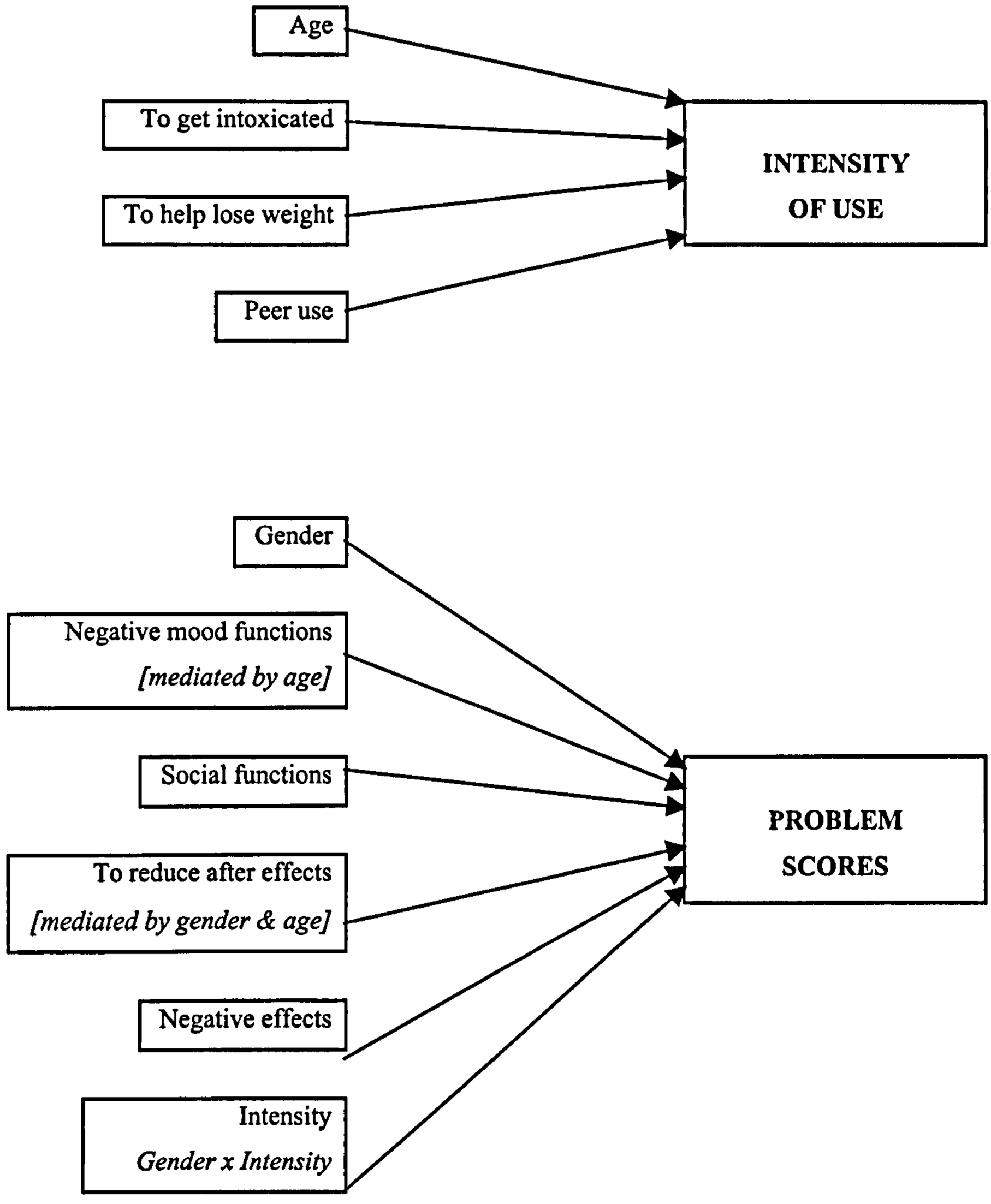


Figure 5.25 Summary of significant variables in each of the ecstasy regressions

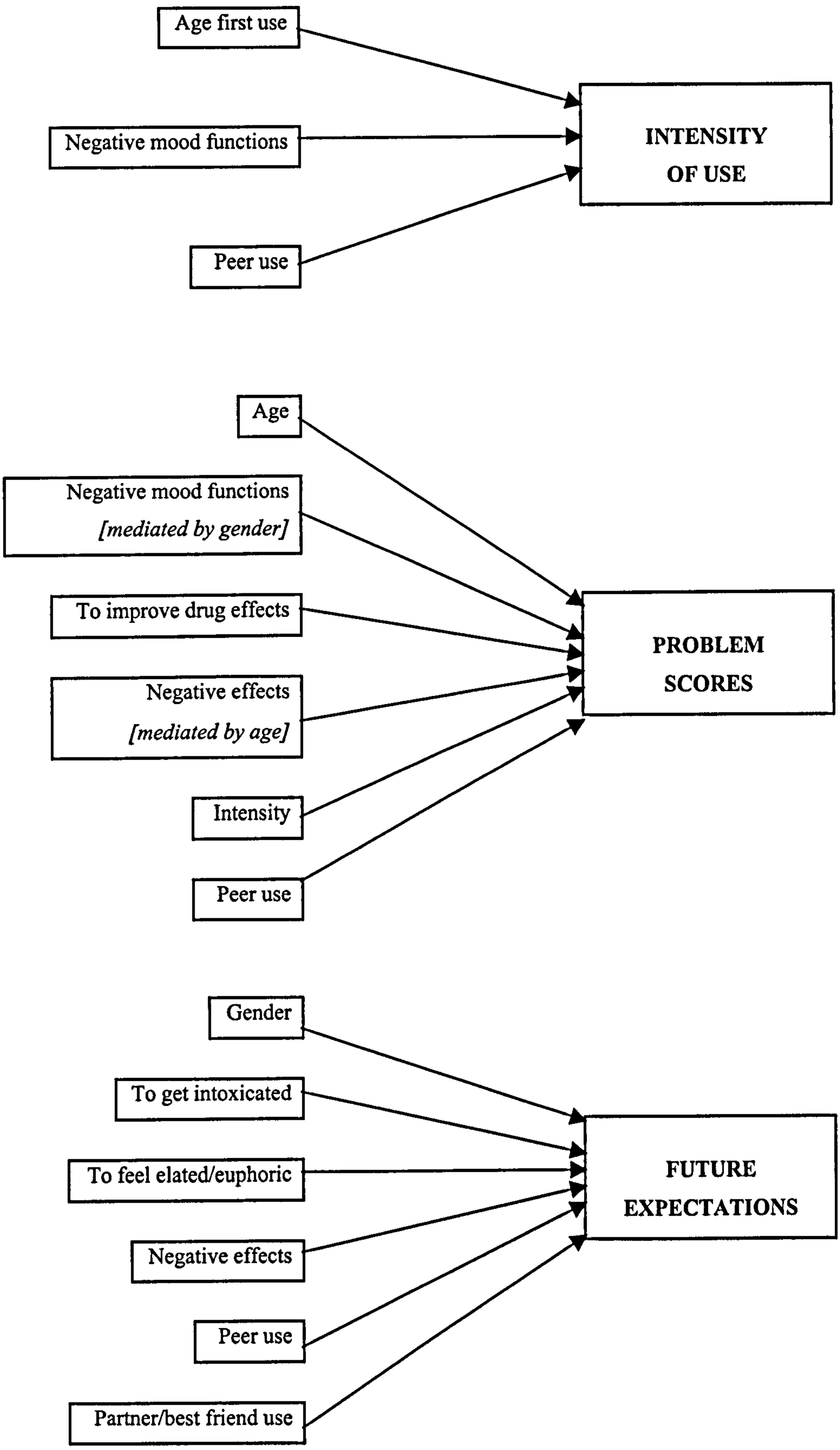
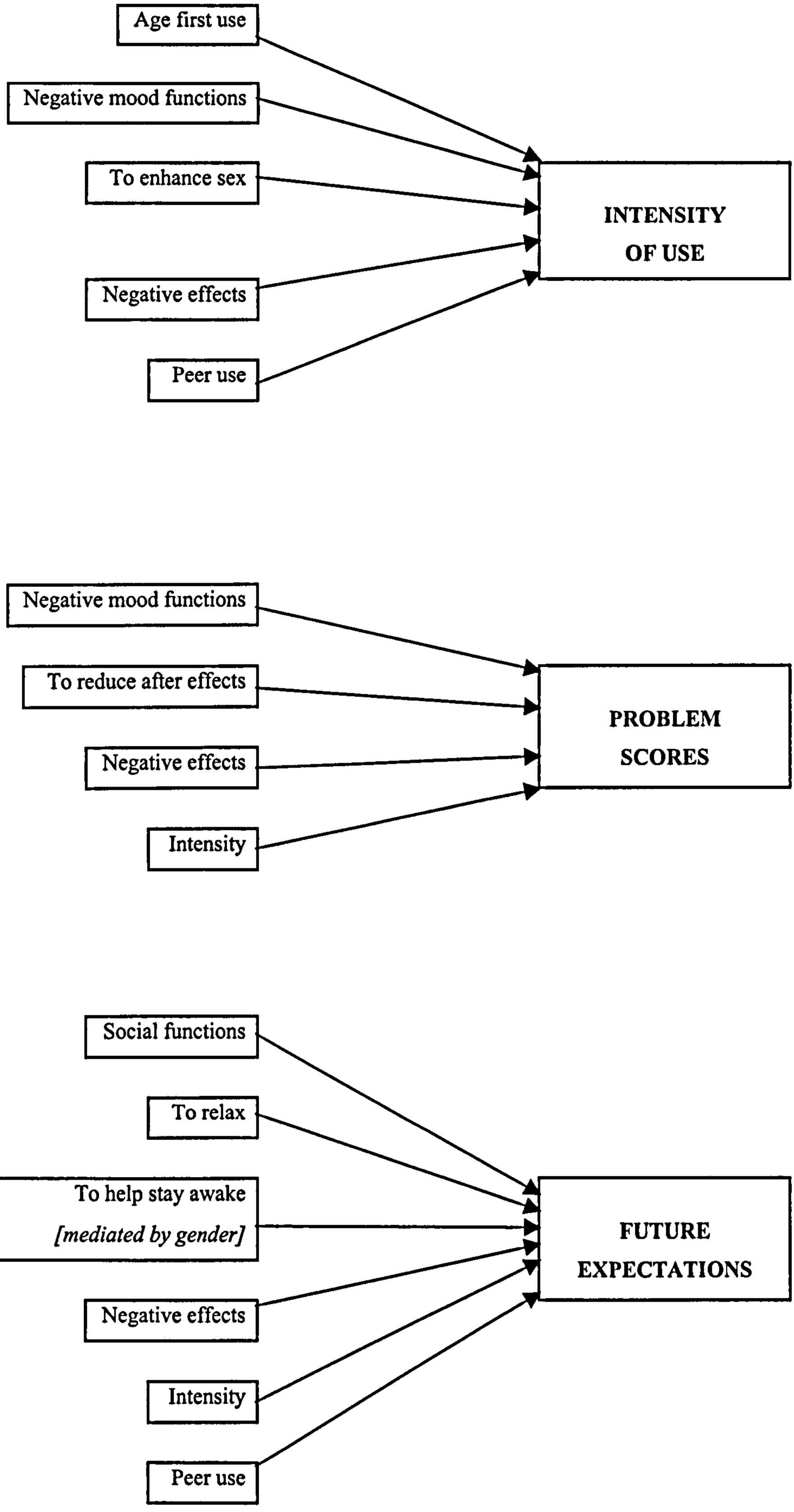


Figure 5.26 Summary of significant variables in each of the cocaine regressions



5.4 Discussion

Study Three investigated the relative influence of demographics, age of first use, peer substance use, functions and negative effects on patterns of alcohol, cannabis, amphetamine, ecstasy, LSD and cocaine consumption in a sample of young polysubstance users. Regression analyses were conducted to develop models to explain current intensity of use, problems relating to use and future use expectations. This final section of Chapter Five discusses the major findings from the analyses presented. First, the descriptive results concerning drug use and associated functions are considered. The main body of the discussion is structured around the eight hypotheses outlined earlier in the chapter (see section 5.1.1). Some general points regarding the subsidiary analyses that examined the data for age and gender differences are then addressed, followed by a discussion of some limitations of the study design. The chapter closes with a brief summary.

5.4.1 Drug-use prevalence

As described in the methods section, the sample was selected to consist of current polydrug users who were not in touch with drug or alcohol treatment services. The levels of drug use recorded were therefore far higher than what would be expected had the sample been randomly generated. In terms of polydrug use, respondents had ever used an average of 6.1 out of the 17 substances asked about in the questionnaire, and three out of the six target drugs during the 90 days prior to interview. Given the inclusion criteria (respondents had to have used at least two illicit drugs in the past three months), these results are what might have been anticipated (most had used two illicit drugs plus alcohol during the past 90 days). As would be expected given current population prevalence data (HEA/BRMB, 1997; Ramsay & Partridge 1999), the most common drugs ever used were alcohol, cannabis and amphetamines. The majority of the sample had used alcohol and cannabis and approximately half had used amphetamines. A similar proportion reported lifetime use of ecstasy and cocaine respectively, and a quarter had used LSD. LSD use was more common among male respondents, but no other gender differences were observed. This latter finding is consistent with data reported from Study One, which suggested that females tended to be more wary of drugs with hallucinogenic effects (such as LSD) than their male peers. Similar findings were reported in Study Two. This lack of gender differences is also

consistent with recent suggestions that the gender gap in substance use has virtually closed over the past decade (Parker et al., 1995, 1998; Egginton et al., 2001).

More than three-quarters of the sample reported that they had used both alcohol and cannabis on more than 100 occasions in their lives. Users of the stimulant drugs generally reported less extensive lifetime experience (most commonly between 21 and 50 times, although more than a quarter of the ecstasy users had used on more than 100 occasions). In contrast, lifetime LSD use was more limited and, compared with the other five substances, a much higher proportion of users had only used this drug once. In summary, the sample could be described as consisting primarily of alcohol and cannabis users who were also users of other drugs, but on a less regular basis.

5.4.2 Age of first use

In general, alcohol was the first of the six target substances to be used (average age of initiation was 13 years), followed by cannabis (14.4 years) and then the 'dance drugs' (ecstasy, amphetamines and LSD) at approximately 16 years of age. The period between the ages of 13 and 16 has been reported elsewhere as the most common time for first experience with drugs (Segal, 1991, 1986b). Male respondents reported first use of alcohol and cannabis at a younger age than females, but no other gender differences were observed in age of first use. Similar findings were reported by Miller & Plant from their survey of more than 7,000 15 and 16 year olds (Miller & Plant, 1996).

5.4.3 Current drug use

Well over three-quarters of the lifetime users of each drug reported use during the last 90 days, with one exception: only half of the lifetime LSD users had used this drug recently and those who had done so tended to be younger than those who had not. These findings, coupled with the different typical profile for LSD use, may indicate that this drug played a different role from the other five target drugs for this sample. It is possible that a substantial proportion of the lifetime LSD users had grown out of using this drug and had found that they preferred to use other drugs instead.

Respondents who reported recent amphetamine use were also significantly younger than those who had not used this drug, as were recent cocaine users. The younger users also tended to report using these drugs more heavily. At the time of data collection, amphetamines and LSD were relatively inexpensive and so may have

attracted younger respondents with more limited disposable incomes. Other studies conducted in the UK have found similar associations between these drugs and younger users (Parker et al., 1995; 1998; Miller & Plant, 1996). However, this explanation is not so compelling in the case of cocaine due to its relative cost (ISDD, 1996). Recent research has noted a tendency for some young cocaine users to describe this drug as relatively 'safe' compared with ecstasy, which has been associated with a number of high-profile sudden deaths – particularly that of Leah Betts (Boys et al., 1999c; 2000c). When the tragic death of this young teenager occurred in 1995, most of the younger users in the current sample had not yet initiated stimulant use. Consequently, when the opportunity arose, they were perhaps more inclined to choose an alternative to ecstasy (Boys et al., 1999c, 2000c). This argument is consistent with evidence from more recent studies in which some young adolescents have tended to rate ecstasy as more dangerous than heroin (Balding, 2000; Breeze, 2001).

As in Study Two, female respondents were significantly more likely to report having used amphetamines during the 90 days prior to interview. These findings support the suggestion noted in Chapter Three that females tend to prefer the more physical effects associated with amphetamines, while males prefer more hallucinogenic effects (see section 3.4.1). However, overall, there was a notable absence of gender differences in patterns of recent use. Two exceptions were that males reported drinking more frequently and that they used more cannabis on a 'typical using day' than their female counterparts. Previous studies have reported similar gender differences in consumption measures for these two drugs (e.g. Newcomb et al., 1988; Miller & Plant, 1996).

5.4.4 Functions for use

A key finding is that despite differences in the pharmacological effects of the drugs studied, with the exception of two items (using to help sleep or lose weight), all of the drugs had been used to fulfil all of the functions measured. This clearly indicates that substance use served multiple purposes for this sample. However, differences in the functions most commonly associated with each drug, appeared to be linked to specific effects. For example, cannabis and alcohol were typically used *"to relax"* and *"to get intoxicated"* whereas the stimulant drugs were most commonly used *"to keep going"* or *"to stay awake"*. Furthermore, ecstasy and amphetamines were frequently used *"to enhance activity"*, while cocaine was more closely associated with increasing

confidence and LSD was typically used for intoxicating purposes or *"to feel elated"*. Despite the finding that all drugs were used to fulfil the majority of the functions tested, the results indicate high levels of consistency between reports of which drug types were commonly used to fulfil which functions. These findings are broadly in line with those reported in the literature on reasons for substance use (Robbins et al., 1970; Lombillo & Hain, 1972; Segal et al., 1980, 1982, 1983; Segal, 1986; Johnson & O'Malley, 1986).

The few participants who did not endorse any of the function items or who endorsed only one or two items for a drug may have had other purposes for their use that fell outside of the 18 items included in the questionnaire. A limitation of the instrument was that it did not include an open ended question to allow users to report any additional functions for use of the target drugs. Alternatively, the possibility that these users did not perceive their drug use to fulfil specific functions should not be ignored. However, these participants were in a minority and all respondents reported at least one function for one of the drugs they had used in the last year (i.e. there were no reports of zero functions for all drug use).

5.4.5 Scale development

A key aim of Study Three was to develop the functions and negative effect scales further, based on the findings from Study One, and to examine the internal structure and reliability of the resulting scales. This was carried out using principal components analyses (PCA) and Cronbach's alpha. This section discusses the results from this process.

PCA of the functions items failed to identify a consistent structure across the six drug types and so two subscales were constructed for use in the multivariate analyses. This finding was perhaps unsurprising given that the function items were developed to measure 18 different functions for drug use rather than acting as different measures of the same underlying construct. For example, logically one would not expect that using a drug *"to lose weight"* would be related to any of the other items in the list, as this purpose is fundamentally different from all the others. The NMF and SF subscales had acceptable internal reliability (i.e. with Cronbach's alpha coefficients above 0.60 - Cohen & Cohen, 1983) for all drugs, with the exception of LSD for the NMF scale, and LSD and cannabis for the SF scale. These findings indicate that although the functions in these scales behaved in a relatively uniform manner across the different drug types, differences did exist.

Mean scores on the NMF scale were highest for alcohol and cannabis and lowest for LSD. This indicates that cannabis and alcohol were the drugs most commonly used to relieve negative mood states. In contrast, the three stimulant drugs (ecstasy followed by amphetamines and cocaine) had the highest mean scores on the SF scale. However the differences in scores between these drugs and those for the other three drugs were small, suggesting that all six target substances were used extensively to fulfil social purposes in this sample. These findings could reflect a general tendency for young drug users to use all drugs for social purposes and in addition to relieve negative mood. Alternatively, as the sample cannot be assumed to be representative, the possibility that the findings simply reflect certain patterns of use peculiar to this particular group of young people cannot be discounted.

5.4.6 LSD

At many points in the data analyses, the results obtained for LSD were consistently different to those for the other five drugs. These inconsistencies could be partially explained by the smaller number of current LSD users in the sample (less than half those for the other drugs). This not only meant that correlations needed to be higher to reach statistical significance, but also that the presence of a few outlying cases could have a greater distorting impact on the results. On the other hand, there could also be a fundamental difference in the nature of LSD and its related functions compared with the other drugs addressed in the study. LSD was the least popular drug among respondents and relatively few of the lifetime users reported recent use of this substance. Furthermore, of the six target substances examined in this study, LSD was associated with the least diverse range of functions. As the number of cases was small, it was not possible to conduct regression analyses for LSD and so it is not clear if this drug would have also exhibited different patterns at the multivariate level. However, in summary the data seem to partially support the conclusion that LSD played a different role from the other five drugs examined.

5.4.7 Hypotheses

In this section, the study hypotheses are re-stated and discussed. Where a hypothesis exists in several parts, these are addressed separately before general comments are made.

Hypothesis 1

There will be a positive relationship between function measures (NUMFUN, TOTFUN, NMF and SF scores) and measures of current use (frequency of use, typical amount used and intensity of use).

Significant positive correlations were observed between the four function measures and measures of current use for all drugs (with exceptions for LSD). These findings indicate that using these drugs with greater frequency and in greater quantities was associated with more frequent functional use, thus supporting Hypothesis 1. Studies that have examined reasons or motivations associated with substance use have reported similar links between more numerous reasons or functions for use and greater consumption levels (e.g. Sadava, 1975; Carman, 1979; Johnston & O'Malley, 1986; Newcomb et al., 1988; Simons, 2000). This link could be interpreted in a number of ways. Johnston and O'Malley suggest that more "needy" individuals (i.e. those with more potential functions to fulfil) tend to become heavier users through a process of self-selection (Johnston & O'Malley, 1986). Alternatively, this finding could be explained in terms of a learning process in which more experienced users become more aware of the various functions that use of a drug might fulfil.

The relationship between functions and current use was further examined in the regression analyses. These analyses found evidence that certain types of function helped to explain intensity of use (when peer use and background measures were controlled) and that these functions differed between drugs. The most consistent items across substance types were using *"to get intoxicated"* and to relieve negative mood states. The former was a significant predictor of intensity of alcohol, amphetamine and cannabis use, but seemed unrelated to ecstasy or cocaine use. It seems that young people in this sample did not use drugs indiscriminately in order to get intoxicated, although for some drugs this was an important purpose for use that helped to explain who used certain drugs more intensively in the sample. While further analyses suggested that use to get intoxicated masked the importance of using cannabis to relieve negative mood and *"to relax"*, no evidence for similar masking effects on the other drugs was obtained.

The extent of using to relieve negative mood states was significantly related to intensity of ecstasy, cocaine and alcohol use in the regression equations. In each case, the relationship was positive, indicating that people who reported frequent use for this

type of function tended to be using more heavily than those who did not. In the case of alcohol, this function was found to interact with age. This effect is discussed further in section 5.4.8.2. As suggested earlier, these findings could be interpreted in at least two ways: either the more 'needy' tend to become heavier users or more experienced users learn to associate other functions with their use. However, it was not possible to establish the direction of this link in the current dataset.

Other functions that reached significance in the regression equations for intensity of use included using to *"to ease after effects"* from other drugs (alcohol), using *"to improve effects"* of other drugs (cannabis) and using *"to lose weight"* (amphetamines). There was evidence that the first variable interacted with gender in its relationship with intensity of alcohol use. Males who reported a higher frequency of using alcohol *"to ease after effects"* from other drugs tended to report more intensive recent alcohol use, whereas a weak effect in the opposite direction was observed for female drinkers. This finding could indicate that for males in this sample, alcohol use was a core component of polydrug using behaviours to a greater extent than for females.

As suspected from the bivariate correlations, the regression analyses did not support a relationship between social functions and intensity of use in any of the drugs, with one exception. In the case of cannabis, SF scores interacted with gender in influencing intensity of use. While using cannabis for social purposes had a slight positive association with intensity of cannabis use in males, the association was much stronger and in the opposite direction in females. This suggests that males who reported more frequent social functions for their use tended to use this drug more intensively than those who reported other functions. In contrast, females who reported more frequent social functions tended to use cannabis less intensively than females with different function profiles. Data from the qualitative interviews reported in Chapter Three suggested that young females often smoked cannabis when they were in social situations and it was offered to them, but were less inclined to purchase it themselves than their male peers. Females who reported more frequent social functions may have only ever used the drug in the above circumstances. In contrast, the males who reported frequent social functions for their use were perhaps more likely to be sharing their own personal cannabis with the group and were thus the major consumers. The fact that males reported using larger quantities of cannabis in all three studies may further support this interpretation. The finding that SF scores did not appear to help explain intensity of use for the other drugs, is worthy of comment. A possible reason for this

finding is that all drug users in this sample used the target drugs for similar social functions. Consequently, variations in SF scores were limited and therefore only weakly related to the more widely varied measures of intensity.

In summary, the analyses generally supported the hypothesised relationship between functions and consumption patterns with some exceptions regarding the SF subscale.

Hypothesis 2

Perceived extent of current peer substance use (particularly that of a best friend or partner) will be strongly related to measures of consumption, although these variables will not exert as powerful an effect as functions.

Pearson's correlations provided evidence to support the first part of Hypothesis 2. Positive relationships were observed between measures of consumption and peer use for all drugs. In contrast, partner/best friend's substance use was only consistently correlated with ecstasy consumption measures and weak correlations were observed between frequency and intensity of amphetamine use and this variable. However, for ecstasy the two correlations (with (i) peer and (ii) best friend/partner use) were broadly similar in size and thus did not support the prediction that partner/best friend use would be more closely related to current use than measures of peer use. Similarly, for the other substances examined, there was no evidence to support this hypothesis.

However, it should be noted that the two measures of peer substance use differed: one was binary (partner/best friend) and the other (peer use) was measured on a five-point scale. Consequently, the two were not directly comparable and the opportunity existed for the five point peer use variable to measure more subtle gradations in use that may have corresponded more closely with differences in patterns of use than was possible with the binary variable. The relative size of the correlations should therefore be interpreted with caution.

It is also possible that the perceived substance use of the peer group is in fact more closely related to personal patterns of use than those of the best friend or partner. As discussed in Chapter One (see section 1.7.1; p.25), Brown (1989) suggested that an individual's social identity may depend heavily on the peer group or 'crowd' and so the strength of influence from the peer group may differ from that exerted by a 'best friend'. Furthermore, respondents in the sample were perhaps too young to have developed all-

consuming relationships with a partner and instead may have tended to spend most of their time in larger groups of peers rather than with just one other person. It is likely that their substance use was perhaps more closely linked to that of the people with whom they spent the largest proportion of their spare time. A third possibility is that 'peer projection' (where adolescents tend to report the behaviour of their peers as similar to their own) (Holmes, 1968; Davies & Kandel, 1981; Sherman et al., 1983; Urberg et al., 1990 - see section 1.7.1), is perhaps more likely to occur when describing the behaviour of an ill-defined group (such as the 'peer group') than a specific individual.

The relationship between peer and consumption measures was further examined using sequential regression analyses so that the relative contribution of different types of variables could be assessed in stages. In each case, the addition of the peer-use variables (step 3) increased the proportion of variance in intensity scores explained by the model by an average of 5% (when age, gender and age of first use were controlled). However, as predicted, this contribution was not as great as that from the function variables (step 4), which added on average an additional 14% to the variance explained. For all drugs, the addition of the function variables (step 4) had an impact on intensity scores over and above that exerted by peer use (step 3). These findings suggest that, in addition to peer use, drug-use functions could play a useful role in helping us to understand differences in consumption patterns.

As discussed in Chapter One, there is extensive evidence that peer substance use is an important influence on an individual's personal use (Kandel et al., 1978, 1986; Huba et al., 1979; Battistich & Zucker, 1980; Jessor et al., 1980; Elliott et al., 1985; Barnes & Welte, 1986; Kandel & Andrews, 1987; Swadi, 1988, 1999; Lopez et al., 1989; Brook et al, 1990). This relationship could be partially explained by the extent to which the individual perceives specific functions for drug use to be personally salient to them. Peer use is likely to be an indicator of how readily available drugs are to an individual, while functions for use could help to explain the extent to which certain individuals are likely to take advantage of this availability. This interpretation does not concur with Oetting and Beauvais's 'peer cluster theory' (Oetting & Beauvais 1986, 1987), which sees the peer group as exerting the strongest and most proximal influence of all and as mediating the influence that other factors have on drug use (Dinges & Oetting, 1993).

While peer use was an important predictor in the models for the illicit drugs, it did not contribute to the model for alcohol intensity. A possible explanation for this finding is that alcohol use is firmly entrenched in our culture to a much greater extent than any of the other drugs studied. By the age of 16, the majority of young people in the UK are alcohol users (Goddard & Higgins, 1999) and so in comparison with other drugs, the variation in the proportion of peers perceived to be 'current' alcohol users was likely to be very limited. Perhaps had additional measures of peer use (e.g. frequency and quantity of peer use) been used, a significant relationship may have been observed between these variables. On the other hand, there could be fundamental differences in the relationship between peer and personal alcohol use as a result of its widespread availability and use throughout society.

In the final set of intensity equations, peer use was a significant predictor whereas partner/best friend's use was not. Further analyses in which peer use was omitted from the regression equations suggested that for ecstasy the relationship between partner/best friend's use and intensity of use was masked by peer use. However, similar effects were not observed in the equations for the other drugs. This supports the finding from the qualitative interviews noted in Chapter Three, where some respondents indicated that they were unlikely to use ecstasy unless accompanied by a close friend or partner, whereas little evidence for similar effects across the other drugs was found. This could be explained in terms of differences in typical effects. The effects from what is sold in the UK as 'ecstasy' vary from stimulating to moderately hallucinogenic (Tyler, 1995). There have also been cases of people suffering potentially fatal side-effects after consuming a substance sold as 'ecstasy' (Tyler, 1995). In contrast the effects from cannabis, alcohol, amphetamines and cocaine may be more predictable. While the dosing of these drugs is relatively easy to manage and the uncertain user can take a small amount, see how it effects them and then consume more of the drug if desired, this is more difficult with ecstasy. The cautious user may therefore feel safer if a close friend or partner is with them when they consume ecstasy, even if they are relatively experienced in using the drug.

In summary, the results were supportive of Hypothesis 2. However, evidence was not apparent to support the conjecture that partner/best friend's substance use would be more strongly related to consumption patterns than peer use.

Hypothesis 3

There will be a positive relationship between problem scores and a) measures of current use (frequency and typical amount) and b) function measures.

(a) Positive correlations were observed between problem scores and measures of current use for all drugs, thus supporting the first part of Hypothesis 3. Similar positive relationships between higher levels of substance use (i.e. more frequent use and heavier consumption) and problems associated with use have been described in the literature (e.g. Sadava, 1985). A number of explanations for this relationship have been suggested. For example, it could indicate that as drug use becomes more intensive, the associated problems increase. Alternatively, people who are experiencing problems associated with their drug use may tend to use more intensively, due to loss of control, or because they have more functions for their substance use.

The regression analyses showed that intensity of use explained between 9% (amphetamines) and 42% (cocaine) of the variance in problem scores, thus providing further support for Hypothesis 3a. The large difference in effect size observed between these drugs could indicate underlying differences in the types of people who use amphetamines and those who use cocaine. However, as these subgroups were not separate (some had used both drugs), an alternative explanation is that there were fundamental differences in the way that these two drugs were used underpinning these findings. Cocaine was consumed intranasally by all users in this sample. In contrast, amphetamines were taken both orally and intranasally. It is possible that the quantities consumed when taken orally differ systematically from those when the drug is 'snorted' (as greater amounts are required to get it into the bloodstream through the gut than nasally, where the passage is more direct). Variations in intensity of use ('amount' multiplied by 'frequency') could therefore be linked to route of use in the case of amphetamines but not cocaine. If so, intensity of use could be a more sensitive measure of the extent of cocaine use, which could explain the stronger link between this variable and problem scores. On the other hand, a methodological explanation for the findings should be considered. It is possible that the problem items were more salient for cocaine users (and thus more sensitive) than for users of the other drugs studied. However, there were no items on which cocaine users scored consistently higher than users of the other stimulant drugs, with the possible exception of item four (*"prioritising spending money on cocaine over other things"*), so this explanation

seems unlikely to account for the large variations recorded. Overall, the available evidence points to the former interpretation.

(b) Problem scores were highly correlated with the four function measures (NUMFUN, TOTFUN, NMF and SF scores) for all drugs with just one exception - LSD. The correlation between SF scores and problem scores for LSD was in the predicted direction, but did not reach significance. This could be due to the smaller number of LSD cases, as discussed earlier. Overall, there was strong evidence that respondents who reported more numerous functions for substance use and more frequent functional drug use tended to have higher scores on the problem scales and this relationship was consistent between different types of function (negative mood and social). One interpretation of these findings is that people who use drugs more 'functionally' are at greater risk of developing problems related to their substance use. On the other hand, the relationships between the extent of functional use and intensity of use and between intensity of use and problem scores noted earlier could help to explain this finding. In other words, the association observed between functions and problems may simply be due to these other correlations. This relationship was therefore explored further in the multivariate analyses in which intensity of use was controlled. These results are discussed in relation to Hypothesis 4.

A third possible explanation of the above findings is that users who have numerous functions for substance use make rational choices to accept the consequential problems as they perceive the benefits of use as outweighing the costs. This interpretation is consistent with the process of cost-benefit analyses proposed by Parker and colleagues (1998) (see section 1.7.4 in Chapter One for further detail).

Overall, the findings supported the hypothesised relationships between consumption, functions and problems relating to substance use in all six drugs.

Hypothesis 4

Function scores (and particularly negative mood functions) will predict problems after controlling for consumption levels.

Hypothesis 4 was supported by the results from the regression analyses in which problem scores were used as the dependent variables. In each case, the addition of the function variables (when age, gender, age of first use, peer use and current intensity

were controlled) considerably increased the proportion of variance in problem scores explained (by an average of 22%). Furthermore, the sequential analyses demonstrated that with the exception of cocaine, the addition of the function variables made the greatest impact on the total amount of variance explained. This evidence calls into question the earlier suggestion that correlations between functions and problems resulted from the correlations between functions and intensity. In particular, the beta weights for NMF scale scores in the final equations for alcohol, cannabis, and amphetamines were of the same order as those for intensity of use which suggested effects of similar magnitude. In the equation for cocaine, NMF scores also made a significant contribution (at the 0.05 level) but the impact of intensity of use was much stronger for this drug. These findings suggest that functions (particular those related to relief from negative mood) could be as important as measures of consumption in explaining drug-related problems.

In contrast to the other function variables, NMF scores predicted problem scores consistently across drug types. A number of explanations for this link can be suggested: first, these findings could indicate that people who use drugs to fulfil certain types of function (notably those related to relief from negative mood states) are more vulnerable to developing problems. Alternatively, the reverse could be true - that people who have already developed problems relating to their use of a drug tend to use these drugs to relieve negative mood more than non-problematic users. The nature of this association could not be determined from the current dataset as this would require longitudinal data. However, it should also be noted that the link could indicate that using drugs to fulfil negative mood functions is simply another facet of the construct defined as 'problematic use'.

In summary, the analyses provided support for Hypothesis 4 for all the target drugs.

Hypothesis 5

Age of first use will be negatively correlated with a) current use and b) problem scores for each of the target drugs.

(a) Significant negative correlations were observed between age of first use and intensity of use for all substances, thus providing support for the first part of Hypothesis 5. However, this variable reached significance in just three of the regression equations

– for cannabis, ecstasy and cocaine. In each case, the relationship with the dependent variable was negative, indicating an association between initiating use at a younger age and more intensive current use when the effects of age, gender, peer use, functions and negative effects were controlled. This finding is consistent with the literature that has identified age of first use as a risk factor for heavy future use and an increased likelihood of developing problems relating to use (Rachal et al., 1982; Fleming et al., 1982; Robins & Przybeck, 1985). A possible explanation for the lack of association between these variables for alcohol is that the measure was restricted. It is not uncommon for children to first use alcohol in the company of their parents at quite a young age. This type of initiation is very different from first using a substance without parental consent or knowledge. It is possible that more consistent results would have been obtained had the question asked for the respondent's age when they first used alcohol without the knowledge of their parents, or alternatively their age when they first became intoxicated.

Explaining the lack of association between age of first use and current intensity of amphetamine use is more problematic. However, the findings reported in section 5.3.1.4 of this chapter that recent amphetamine users tended to be younger than non-users, coupled with the fact that a smaller proportion of lifetime amphetamine users reported recent use than for the other two stimulant drugs, could be interpreted as indicating that users tend to mature out of amphetamine use. If this is the case, that there was a general move away from amphetamine use towards other drugs as age increased, it could explain the anomalous relationship between current intensity of amphetamine use and age of first use.

(b) The second part of Hypothesis 5 was also supported at the bivariate level. Correlations between age of first use and problems scores for each drug were negative and reached significance for all drugs with the exception of LSD. However, despite these bivariate correlations, age of onset did not make a significant contribution to any of the regression equations for problem scores. In the equations for ecstasy and cocaine, the addition of age of first use (step 2) explained an extra 10% of the variance in problem scores over and above the proportion explained by demographics, while a weaker, but significant effect was observed in the equation for alcohol. However the apparent relationship between this variable and the problem scores was explained by other variables in the final regression equations. The finding that age of first use made

no contribution to the equations for cannabis or amphetamines suggests that the apparent relationship between age of onset and problem scores for these two drugs was explained by variations in age, gender and peer use.

Further analyses suggested that the effect of age of first use on problem scores was mediated by intensity of use. In other words, for all drugs, the apparent relationship between age of onset and problems was explained by variance in intensity of use. Age of first use acts as an indicator for length of drug-using career. It therefore seems that those who had been using the drugs for longer, tended to be heavier current users, and heavier current users tended to have higher problem scores. Consequently, while age of onset may be a useful marker of risk, it appears to be escalation in use (indicated by intensity) that is the real problem predictor.

Hypothesis 6

There will be a strong positive relationship between future expectations and a) current patterns of use, b) overall functions for use, c) current peer use and partner/best friend's use.

(a) The first part of Hypothesis 6 was supported by bivariate correlations that suggested between 5% and 30% of the variance in future expectation scores was explained by intensity of use for all six drugs. As previously discussed, for a variety of social behaviours past behaviour is a strong predictor of future behaviour (Mullen et al., 1987; Godin et al., 1993; Norman & Smith, 1995; Sutton, 1994, 1998) and evidence exists in the literature to support this relationship in the case of drug use (e.g. Bachman et al., 1984; Newcomb & Bentler, 1986; Newcomb, 1995). Consequently, strong positive correlations between current patterns of use and future expectations would be expected.

Similar relationships were observed between future expectations and frequency and 'typical amount used' for all drugs, with the exception of LSD. Nevertheless, the correlations with LSD consumption measures were of a similar size to those observed in the other drugs and the lack of significance could be due to the small number of LSD users.

(b) Overall, the correlations between the function measures and future expectation ratings for all drugs were in a positive direction and reached significance (with some exceptions for cannabis and alcohol). These findings provide further support to the

results reported in Chapter Four. Individuals who recognise their recent drug use as having served more purposes for them are likely to expect that their use will continue in the future. To establish whether this relationship might be primarily explained by the link between functions and current use (and the relationship between past and future behaviour), multiple regressions were performed which controlled for the effects of intensity on future expectations (see discussion of Hypothesis 7). Results from these analyses suggested that this may have been the case.

A possible explanation for the weaker results from cannabis and alcohol is that the variation in future expectation scores for these drugs was much more limited. The majority of respondents indicated that it was extremely likely they would use these drugs again within the 12 months following interview. The lack of spread on these variables compared with the other four drugs is likely to have reduced the strength of the correlation. Consequently, the results should not necessarily be interpreted as indicating that alcohol and cannabis were fundamentally different from the other drugs examined. It is possible that a positive relationship would have been observed between the function measures and future use had this latter variable been measured differently. Overall, these findings provide partial support for Hypothesis 6b.

(c) Future expectation ratings were strongly correlated with measures of peer use for all drugs. Positive correlations were also observed between future expectations and perceived partner/best friend's use for all drugs except alcohol and cannabis. These relationships were examined more closely in the regression analyses. For the three stimulant drugs (amphetamines, ecstasy and cocaine) the greatest change to R^2 occurred with the introduction of the peer-use variables. Between 11% (cocaine) and 32% (amphetamines) of the variance in future expectation scores was explained by the addition of peer-use variables (when age of first use, age and gender were controlled). In contrast, the contribution of peer use to the equations for cannabis and alcohol was smaller. Nevertheless, in the final regressions, the perceived extent of peer use significantly predicted future expectations for all five substances and partner/best friend's use reached significance in the equations for amphetamines and ecstasy.

These findings suggest that people who reported that a greater proportion of their friends were users of a specific drug tended to indicate it more likely that they would continue to use this drug themselves. In support of findings from Study One, the drug use of an individual's best friend/partner appeared to influence amphetamine and

ecstasy use more strongly than peer use in general. For cocaine, a similar effect was masked by the contribution of peer use, but an equivalent relationship was not observed for cannabis or alcohol. These findings are in accordance with the literature that notes a positive link between the extent of peer and personal drug use (Kandel et al., 1978, 1986; Jessor et al., 1980; Elliott et al., 1985; Barnes & Welte, 1986; Kandel & Andrews, 1987; Brook et al., 1990). These results are also consistent with those discussed in relation to Hypothesis 2 in which partner/best friend's use of amphetamines and ecstasy correlated with consumption measures for these two drugs. As mentioned previously, the clustering of the majority of future expectation scores for alcohol and cannabis on just two points could have suppressed a correlation with partner/best friend's use. Alternatively, this finding could indicate a fundamental difference in the relationship between individual and peer use for these two substances. Being the most widely used psychoactive substances within this age group in the UK (Ramsay & Spiller, 1997; Ramsay & Partridge, 1999; HEA/BRMB, 1997), it is possible that having peers or a close friend/partner who uses these drugs has less influence on the choices made by users than for the less prevalent substance types.

Overall, the results provide support for parts (a) and (c) of Hypothesis 6: measures of current use and peer use were both positively related to future expectations regarding use of each of the target drugs. However, the analyses only partially supported part (b) of the hypothesis: most of the function measures were related to future expectations in the predicted direction, but there were some exceptions.

Hypothesis 7

Function scores will predict future expectations after controlling for consumption levels and peer use.

The introduction of the function variables into the regression equations for future use expectations (step 5) had a small impact compared with that observed in the equations for intensity and problems. However, there was one exception - for ecstasy, the change in R^2 was similar to that observed in the model of intensity of use. This suggests that functions generally played a smaller role in explaining variation in future expectation scores than current intensity of use or problems. Nevertheless, Hypothesis 7 was supported. These findings lend support to the idea that future substance use is related to the functions that use is perceived to fulfil over and above current patterns of behaviour.

Frequency of using a substance *"to get intoxicated"* predicted future use expectations in alcohol, cannabis and ecstasy. There was no evidence to suggest that this function masked relationships between other function items and the dependent variable. More frequent use *"to feel elated"* was related to higher expectations that ecstasy use would occur in the future, but was unrelated to expectations regarding any of the other four substances. In contrast, using cocaine *"to relax"* was associated with weak future cocaine use ratings. This could be as a result of the pharmacological action of this drug being incompatible with this function.

Despite being strongly correlated with future expectations for all three of the stimulant drugs, using *"to stay awake"* only reached significance in the equation for amphetamines. This suggests that the apparent relationship between these variables for ecstasy and cocaine was explained by variation in other covariates in these equations. However, the addition of an interaction term between gender and using *"to stay awake"* in the final model for cocaine revealed a significant association between these variables and future expectations for this drug. Female cocaine users who reported using cocaine *"to stay awake"* tended to have higher scores on the dependent variable, whereas the opposite effect was evident in male cocaine users. This could indicate a propensity for females to choose cocaine to help stay awake.

Finally, frequency of using *"to ease after effects"* was significantly related to future use expectations for cannabis only. This could indicate a fundamental difference in the type of function that cannabis fulfilled for the sample. Data reported in Chapter Three (and elsewhere – e.g. Nabben & Korf, 2000) suggested that to the exclusion of all other drugs, cannabis was more frequently used to help manage the 'come down' (or after effects) from stimulants and hallucinogens. It therefore seems that for some users cannabis use was closely linked to their use of other drugs.

Overall these findings provide support for Hypothesis 7: several different functions for substance use made significant contributions to the models of future expectations when intensity of use and peer use were controlled for and these functions differed between drug types.

Hypothesis 8

Negative effects will be associated with (a) using the substance less frequently, (b) higher scores on the problems scales and (c) weaker expectations regarding future use.

(a) Bivariate correlations did not support the first part of Hypothesis 8. Frequency of use correlated significantly with negative effects scores in just two substances (alcohol and cocaine). However, in both cases the correlations were in a positive direction, which suggested that greater experience of negative effects was linked to increased (rather than decreased as hypothesised) frequency of substance. Similar findings were reported by Huba et al. (1986). These findings could be explained using a cost-benefit model similar to that discussed by Parker and colleagues (1998). Cocaine and alcohol users may have expected negative effects from their use of these drugs, but perceived that the attendant benefits of using outweighed these perceived costs and so continued to use.

The lack of similar relationships between use measures and negative effects for the other drugs could indicate that more frequent use of these drugs was not associated with more experience of negative effects. Alternatively, the items in the negative effects measures were perhaps more relevant to alcohol and cocaine. However, although an examination of the individual items might support this latter explanation for alcohol, data for cocaine were not obviously different from those for the other drugs.

(b) Strong positive correlations were observed between negative effects and problem scores for all drugs, thus providing support for Hypothesis 8b. However, although these variables all reached significance in the regression equations, negative effects had an average impact of just 5% on the variance in problem scores explained (when demographics, age of first use, peer use, intensity, and functions were controlled). In other words, although negative effects were generally strongly related to problem scores, they made little contribution to explaining the variance in scores on this variable over and above the other variables examined. One interpretation of this is that the negative effects items may have in fact been tapping into another facet of what we might define as 'problematic use' rather than a completely different construct. Alternatively, the relationship could indicate a tendency for users who were experiencing greater problems to perceive the benefits associated with using these drugs as outweighing the costs. The relationship between general problems resulting from substance use and negative outcomes associated with specific occasions of use is likely to be complex and therefore difficult to disentangle for measurement purposes.

(c) The final part of Hypothesis 8 was not supported by bivariate correlations. Negative effects were broadly independent from future expectation ratings except in the case of cannabis. Here the association was significant, but positive (i.e. contrary to the hypothesised direction). However, a different picture emerged in the multivariate analyses. In the first set of regressions predicting future use expectations, higher negative effects scores in cannabis and ecstasy users were related to weaker expectations that use would continue. Similar associations were observed between negative effects and future expectations for amphetamines and cocaine, but were not sufficiently large to reach statistical significance. In addition to these findings, the final regressions for future expectations revealed that negative effects were also related to alcohol expectations, but that the relationship was quadratic rather than linear, implying that the effect decreases with increasing scale scores. Overall, these findings provide limited support for part c) of Hypothesis 8 although the relationship between negative effects and future expectations appeared to differ across drug types. Huba and colleagues (1986) reported that adverse consequences from drug use did not predict future use over and above current patterns of use. They interpreted this finding as indicative that experience of adverse reactions to drug use did not discourage young people from using. Three responses to negative effects from substance use were identified in Study One – the user i) accepted the effects, ii) modified their behaviour to reduce future negative effects or iii) abstained from future use. This suggests that it is likely that some of the people who had experienced negative effects in the past year in association with their drug use had already found ways to manage or prevent these effects from re-occurring without having to abstain from use altogether. If this were the case, it could explain why higher negative effect scores were not associated with weaker expectations regarding future use of the drugs.

In summary, only partial support was obtained for Hypothesis 8. Contrary to expectations, negative correlations were not observed between negative effect scores and (a) frequency of use or (c) future expectations. However, the multivariate analyses provided partial support for (c), indicating that higher negative effects scores were linked to weaker future expectations regarding cannabis and ecstasy use. There was evidence that higher negative effect scores were associated with higher problem scores, thus supporting part (b) of the hypothesis.

5.4.8 Additional analyses

The analyses examined the function variables for age and gender differences. The following sections discuss these results. Some additional discussion concerning interaction terms with these variables is also presented.

5.4.8.1 Gender

With the exception of cocaine, there were few gender differences in the function items. Here, females tended to use cocaine for reasons that appeared to be oriented towards 'external' goals (i.e. linked to social activities or physical gains such as weight loss or staying awake), while males were more focused on the drug effects (e.g. using cocaine and alcohol *"to improve effects"* of other drugs and also using alcohol *"to ease after effects"* of other substances). Gender differences in reported reasons for substance use have been documented in the literature (e.g. Edwards et al., 1973; Ratliff & Burkhart, 1984; Orford & Keddie, 1985; Carman & Holmgren, 1986; Windle & Barnes, 1988; Newcomb et al., 1988; Graham, 1989; Klein, 1992; Dunne et al., 1993; Billingham et al., 1993; Beck et al., 1995). For example, females have been found to be more likely to report using alcohol to increase confidence (Foxcroft & Lowe, 1993), amphetamines to lose weight (Johnston & O'Malley, 1986) and cocaine to stay awake (Johnston & O'Malley, 1986). Such findings have led researchers to suggest that males and females tend to use substances for different types of reasons. For example, as early as 1948, Riley and colleagues noted a more marked association between drinking frequency and 'individual' reasons in females (Riley et al., 1948). More recently, Johnston & O'Malley (1986) reported a greater tendency for young females to report substance use in association with "*coping with negative affect, or with self-medication or other functional reasons*" (p. 64). The study findings support the idea that there are underlying differences in the ways that males and females make use of drugs and the role that substance use plays in their lives. While it is possible that males and females were more inclined to admit to different functions, the fact that similar gender differences were not observed in the same items for all six substances, suggests this latter interpretation is unlikely. Furthermore, results from the qualitative study (see section 3.4.1) also noted gender differences, which supports this conjecture. This could have implications for both prevention and treatment approaches as it could indicate a need to use different approaches for males and females. This issue is discussed in more detail in Chapter Six.

5.4.8.2 Age

Several age differences were found in the function items. For example, using a drug to *"to feel elated"* was more common among older cannabis, amphetamine, ecstasy and alcohol users. As was using cannabis *"to sleep"* and drinking alcohol *"to lose inhibitions"*. In contrast, using cannabis, amphetamines, ecstasy or cocaine *"to stop worrying"* and amphetamines, cocaine or alcohol *"to decrease boredom"* was more common among younger users. Respondents who had used ecstasy or cocaine *"to feel better"*, or cannabis or ecstasy *" to increase confidence"* also tended to be younger than those who used these drugs for other purposes. These results appear to partially contradict findings noted by Newcomb and colleagues (1988), who suggested that motives for alcohol and cannabis use concerned with reducing "negative affect" increased with age. To a certain extent the opposite seems to be evident in the current dataset. However, two important characteristics of the sample used by Newcomb et al. should be considered: first, the average age of respondents was lower than the current sample and so the age effects noted were occurring between grades 10 and 12 (i.e. ages 16-18). Second, their sample consisted of both users and non-users and so the possibility that their findings could have been biased by non-users' general perceptions about drug use should not be ignored.

The findings from the current study suggest that as young people emerge from adolescence into young adulthood their functions for substance use alter, a finding for which there is further evidence in the literature (e.g. Newcomb et al., 1988; Novacek et al., 1991). A possible explanation for these differences was offered by Haden & Edmundson, who suggested that as young people mature, their motivations for substance use become more personally focused (Haden & Edmundson, 1991). Overall, the analyses suggest that the ways in which young people use drugs may change as they get older. Chapter Six discusses this issue further.

5.4.8.3 Age and gender interactions

A number of interactions between age and gender and the main variables were identified during the regression analyses. Although these did not impact on the main effects described, they will be discussed briefly.

Age interactions were relatively uncommon in the regressions predicting intensity of use. The analyses revealed that the association between alcohol NFM score and intensity of alcohol use was more marked in older users. A possible explanation is

that older, more intensive drinkers were more aware of (or more willing to admit to) using alcohol to fulfil these types of functions. It is also likely that access to alcohol was relatively easy for older respondents as although many under 18s drink alcohol regularly (Miller & Plant, 1996; Goddard & Higgins, 1999; Boys et al., 2001a), there may be more constraints on use, such as having less disposable income or less opportunity to drink on a daily basis (especially if living with parents). Consequently, older drinkers who wanted to use alcohol to help them to deal with negative mood states may have had more opportunity to do so on a more frequent basis.

A similar interaction between intensity of use and age was observed in the model for alcohol problems. Heavier use was associated with higher problem scores in older drinkers in the sample. One explanation of this finding could be that older drinkers are more susceptible to alcohol-related problems when drinking at high levels than younger respondents drinking at equivalent levels. This interpretation fits within the idea that problematic alcohol use typically develops after several years of regular drinking. For example, it has been suggested that a person must have been drinking for between six and eight years before a withdrawal syndrome will be evident (Segal, 1990) and only very rarely will a young person reach this threshold criterion (Segal, 1996). It could therefore follow that earlier signs of problems may also take some time to develop – which would explain why older, heavier drinkers in the current sample tended to have higher problem scores than younger respondents drinking at similar levels.

Gender interacted with the relationship between intensity of amphetamine use and problem scores. Female users who reported more intensive recent use had higher problem scores than males using at equivalent levels. In contrast, less intensive female amphetamine users tended to have lower problem scores than males using at a similar level. This finding could be interpreted to indicate that females who were using amphetamines relatively heavily were more aware of links between their use and problems than males using at equivalent levels. It is also possible that males in the sample were more resistant to adverse consequences related to amphetamine use than females.

Gender also interacted with the relationship between ecstasy NMF scores and ecstasy problem scores. The relationship between these variables was more strongly positive in female ecstasy users. In other words, females who reported greater use of ecstasy to fulfil negative mood functions tended to admit to more problems relating to their use than males with similar functional profiles for this drug. This could indicate a

gender difference in propensity towards problems associated with ecstasy use. Alternatively, female ecstasy users who are already experiencing problems associated with their use are perhaps more likely to choose this drug to help relieve negative mood states than male users with similar problem profiles.

A number of other interaction terms were identified in the analyses. However, in several cases explanations for these findings were unclear and so the possibility that they arose from data anomalies should not be overlooked.

5.4.9 Limitations of the study

It is important to consider a number of potential methodological issues when interpreting the present results. To avoid repetition, points that are similar to those discussed in Chapters Three and Four are only noted briefly.

For reasons stated earlier, the sample was not randomly generated. Instead respondents were accessed via snowball sampling. The limitations of this type of sample need to be recognised. In particular, the extent to which the sample is representative of the wider hidden population(s) from which it was drawn, or of 16 to 22-year-old polydrug users in general is unknowable and so the data should be interpreted with this in mind. Although a possible alternative strategy would be to select polydrug users from within a randomly generated sample of 16-22 year olds, given current population drug-use estimates (Ramsay & Spiller, 1997; Ramsay & Partridge, 1999), several thousand cases would have been required to ensure that sufficient cases were available for analyses.

The use of peer interviewers has both advantages and disadvantages. For example, it was possible to recruit and interview a large number of respondents during a relatively short period and within the available resources. It was also hoped that if interviews were carried out by people known to the interviewees and of relatively equal status (both chronologically and socially), the impact of demand characteristics (as described in Chapter Two) would be reduced. This method could also help interviewees to feel more motivated to provide accurate information. A further advantage was that as they already knew something about the respondent's lifestyle and peer group, a peer interviewer would be in a better position than a stranger to detect possible inaccuracies in the responses given. A trade-off against these advantages was the possibility that impression management may have been more important in front of friends than a total stranger, thus creating a different set of demand characteristics. Furthermore, because a

team of peer interviewers was used, the uniformity across interviews was likely to be reduced. To address this problem, considerable effort was invested in ensuring that all interviews were conducted according to a standardised protocol that tried to minimise variations in data collection procedures. Interviews were taped so the researcher could verify that this protocol was being adhered to. This also facilitated the identification and correction of inconsistencies or anomalies in the questionnaires before the data were coded for statistical analyses, as well as highlighting areas where the interviewers needed further training. A third strategy was to give interviewers clear guidance on how to behave towards the interviewee both before and during the interview: interviewers were instructed not to express any opinions about the questions, subject matter or process, and to respond neutrally to the answers given. It was hoped that these measures would help to reduce potential bias in responses.

Other methodological issues related to the choice of measures. First of all, the data relied solely on self-report (see section 2.5.5 for discussion). This decision was primarily based on resource constraints, but was also grounded in the literature (e.g. Oetting & Beauvais, 1990; Johnston & O'Malley, 1985; Parker, et al., 1998). The use of objective measures (such as urinalysis) might have strengthened the accuracy of the data in several ways. This would have enabled questionnaire responses concerning recent drug use to be verified. Thus respondents whose answers did not concur with the urinalysis results could have been dropped from the analyses. Second, the knowledge that such checks were going to be made might have encouraged respondents to report more accurately. However, as this was not possible in the current study, a number of alternative strategies were employed to try to maximise the likelihood of respondents providing accurate data. For example, participants were reassured that their responses would remain confidential and anonymous. The interviewers were also trained to probe or challenge interviewees (in a non-threatening manner) if they felt that the responses were inconsistent or inaccurate.

Second, the questionnaire did not contain any measures of polydrug use and so this factor could not be controlled for in the regression analyses. The issue of polydrug use is extremely complex and finding appropriate measures to capture behaviour is notably problematic (Earleywine & Newcomb, 1997). Nevertheless, it is possible that the regressions could have been strengthened had some sort of polydrug use measures been available for analysis.

The third measurement concern is a linguistic issue. Two variables in the analyses addressed peer substance: the proportion of friends who were likely to use each drug in the next 12 months (referred to as "perceived peer use") and whether or not the respondent's best friend or partner was likely to use each drug during this time period ('partner/best friend's use'). Both of these measures relied heavily on a shared understanding of the terms 'friends', 'best friend' and 'partner'. If clarification was requested, interviewers were instructed to ask respondents to base answers to the first question on the group of people with whom they regularly spent time. It is also worth noting that an individual's 'best friend' and 'partner' may represent very different types of influence on their behaviours and these influences are likely to vary across individuals and across time. Thus combining these two terms to form one measure was a crude representation of a complex set of dynamic relationships. This could have contributed to the inconsistent results pertaining to this measure across the different drugs. Ideally, these data should have been collected from or verified by the third parties involved and scored separately. However, time and resource constraints on the current study meant that this was not possible.

A final limitation to this study concerns the design. The cross-sectional nature of the study demanded that 'future use' was measured in terms of expectations rather than actual behaviour. Ideally, these measures would have been supported by follow-up data that would have allowed the predictive power of the models to be tested more rigorously. In particular, the problem noted earlier regarding the lack of variation in the response measure for cannabis and alcohol could have been addressed by using quantity or frequency follow-up measures of use instead of the much more simplistic measure of how likely it was that use would occur. An additional advantage is that longitudinal data would have allowed links between variables to be examined in terms of the direction of causality. For example, it would have been possible to test whether increased negative mood functions preceded problems relating to use or vice versa. Similarly, this would have provided the opportunity to examine the impact of recent experience on responses to negative effect items, functions and future expectations.

5.5 Chapter summary

This third study explored patterns of use of six psychoactive substances in a sample of 16 to 22-year-old polydrug users. The study aimed to build on findings from Chapter Four by extending the functions and negative effects scales, and examining the extent to which the items co-varied. These variables were then used together with demographics and measures of peer use to model current patterns, problems and future use expectations in the sample.

The 18 function items supported the extraction of two subscales for each drug: a three-item negative mood function (NMF) scale and a five-item social function (SF) scale. The remaining items were analysed separately as they were essentially unrelated to one another.

The results provided evidence that functions for use serve an important role in helping to understand patterns of use and more importantly problems relating to drug use in young people. The drug-use functions made significant contributions to models of current use and future expectations over and above peer use. Functions were also significantly related to problem scores when the effects of current intensity of use were controlled. In particular, a marked relationship between using a drug to relieve negative mood and greater experience of problems associated with its use was observed. No evidence was found to suggest that greater recent experience of negative effects from a drug was related to less intense use. Finally, additional analyses indicated negative relationships between age of first use and current use and age of first use and problem scores for each drug. The latter relationship was mediated by intensity of use.

The concluding chapter (Chapter Six, which follows) draws together the results from all three of the studies described and considers the implications of this work both in terms of enhancing understanding of polydrug use in young people and informing practice. Overall, limitations of the research programme together with possible future directions for research are also discussed.

CHAPTER 6: SUMMARY AND DISCUSSION

6.1 Introduction

The aim of this thesis was to describe and explain patterns of substance use and associated problems in a sample of young people. This was tackled in three stages: the first study (Chapter Three) used qualitative data collection techniques to identify salient influences on drug consumption in the target population. The findings were then used to inform the identification of domains and measures for use in studies two and three. A number of demographic, environmental and individual influences were identified. In addition to a range of 'functions' for drug use, several common negative effects associated with substance use were observed. Study Two (Chapter Four) built on these initial findings by developing scales to measure functions and negative effects, and examined the feasibility of using such measures in regression analyses to model patterns of substance use and future expectations. The results from Study Two suggested that functions for use could help to explain frequency of use and future use expectations for alcohol, cannabis, ecstasy and amphetamines when peer substance use was controlled. However, the relationship between negative effects and the dependent variables was unclear. The main study (Chapter Five) developed the scales further and tested more complex models that used background variables, peer use, negative effects and functions for substance use to explain current patterns of use, problems associated with use and future use expectations.

In this final chapter, the key findings from the three studies are reviewed and their implications discussed. The chapter starts by presenting a brief summary of the results from each of the three studies and discussing some of the limitations of the approaches used. This is followed by a review of the main implications that this work has for understanding patterns of substance use. Next, some potential practical applications are considered in terms of drug prevention, interventions and policy. The chapter concludes with a summary and some suggestions for future research directions.

6.2 Summary of key findings

6.2.1 Study One

Study One gathered qualitative data from 40 young people aged between 16 and 22 using in-depth, face-to-face interviews. The study aimed to examine patterns of

polydrug use from the perspective of the individual and to ascertain which of the influences identified in the literature were salient to the sample. The findings from this study were then used to inform the selection of measures for use in the two quantitative studies described in Chapters Three and Four.

A range of demographic, social environment and individual-level influences on substance use were identified. These included gender, drug availability, peer influence, expectancies, negative effects and functions for substance use. A number of gender differences in patterns of substance use were evident and there was some suggestion that males and females had different preferred effects. The data indicated that a lack of availability sometimes resulted in an alternative drug being consumed rather than abstinence. Although it was common to have friends whose substance use was similar to their own, many respondents also described friends who had quite different use profiles. Overall, the interviewees did not perceive their peers as exerting overt pressure on them to use drugs, but as providing opportunities to use and a supportive environment within which use could occur. The substance use of partners and best friends seemed to be particularly influential on the use of drugs other than cannabis and alcohol. However, interviewees clearly saw themselves as active decision makers regarding their own patterns of substance use, rather than victims of peer pressure.

Three central, individual-level influences were identified in the data: expectancies, negative effects and functions for substance use. There was evidence to suggest that expectancies were frequently modified, often as a result of direct personal experience. As experience increased, factors such as dose and current physical or psychological state were taken into consideration. However, it was also noted that holding generally positive expectancies regarding the use of a substance did not necessarily lead to use, which appeared to be more closely linked to perceived functions. Experience of negative effects appeared to play an important role in expectancy modification. Responses to negative effects fell into three categories: i) acceptance, ii) behaviour modification and iii) subsequent abstinence. In all three cases expectancies were likely to be modified to assimilate the experience of negative effects. Similar types of negative effects were commonly described across different drug types.

A range of different functions for substance use were identified and categorised into five domains: i) social purposes, ii) changing mood, iii) physical effects, iv) facilitating activity, v) managing other drug effects. There was clearly a certain degree

of commonality in functions for use across drugs, although different substances were also used for different purposes.

The results were discussed in relation to a 'cost-benefit analysis' framework in which the advantages for using a drug under particular circumstances were weighed up against potential disadvantages. Overall, it was suggested that internal, individual-level factors played a central role in this process and should therefore be recognised (and measured) in efforts to understand patterns of substance use.

6.2.2 Study Two

The second study used a short, interviewer-administered quantitative questionnaire to gather data from 100 young people aged between 16 and 22. The study was designed to test the proposed modelling approach for the main study on two dependent variables: current frequency of use and future use expectations. The substances examined were alcohol, cannabis, amphetamines, ecstasy and LSD. Study Two also provided the opportunity to use findings from Study One to develop scales to measure perceived functions for drug use and negative effects, and to examine the predictive utility of these measures in regression models.

The functions and negative effects scales were shown to have acceptable internal reliability for all drugs examined (assessed using Cronbach's alpha coefficient), thus indicating that these were reliable measures. Three out of the four hypotheses tested in Study Two were supported in the analyses. The data suggested a positive relationship between current frequency of substance use and future expectations. There was also evidence linking higher function scores (ie more frequent functional use) with higher frequency of substance use and stronger future use expectations, and for a positive association between individual substance use and the perceived substance use of peers. However, the data provided little support for the hypothesis that higher negative effects scores would be associated with less frequent use and weaker expectations regarding future use.

In the regression models, scores on the functions scales were the single strongest predictor of current frequency of alcohol, cannabis and amphetamine use, but were exceeded by 'peer use' in the case of ecstasy. Function scores were also strongly related to future expectations when current frequency of use was controlled. In contrast, negative effects scores did not make a significant contribution to any of the regression models. It was suggested that this latter finding may have resulted from limitations

regarding the negative effects measures, which recorded lifetime prevalence, rather than recent experience. This measure was amended to use a shorter time frame (past year) in Study Three.

Overall, the results from Study Two provided support for using multiple regression analyses to model patterns of substance use in the main study. Tentative evidence that functions for the use of different substances could be measured and could make a useful contribution to models explaining frequency of use and future expectations was also established. However, the utility of including negative effects in such models was unclear. These findings formed the solid basis for the main study, which examined the key research questions in more depth.

6.2.3 Study Three

The third study used a similar research design to Study Two. Data were collected via face-to-face interviews with 364 young people using a structured quantitative questionnaire. A team of peer interviewers was trained to recruit and interview eligible participants for the study. This differed from the researcher-administered interview method used in Studies One and Two. People were eligible if they were aged between 16 and 22 and had used at least two illicit drugs on five or more separate occasions during the three months prior to interview.

The functions scale was developed further to comprise 18 items based on the findings from studies one and two. These items supported the extraction of two subscales to measure "negative mood functions" and "social functions" for each drug. Functions such as *"to lose weight"*, which appeared unrelated to other items, were treated as single variables in the analyses. Overall, drug-use functions helped to explain current use and future expectations over and above peer use. Similarly, when current intensity of use was controlled for, functions added to the proportion of variance in problem scores explained in the regression equations for each drug. In particular, a consistent positive relationship was observed between using a drug to relieve negative mood and greater experience of problems associated with its use.

The regression analyses revealed consistent positive relationships between peer use variables and current intensity of use and future use expectations for all drugs. However, the results pertaining to the influence of partner/best friend's substance use were varied and did not support the prediction that partner/best friend's use would be more closely related to behaviour than general measures of peer use.

In common with the findings noted in Study Two, there was no evidence to suggest that greater experience of negative effects related to a drug was related to less intensive recent use. In contrast, there was some indication that high negative effects scores were linked with weaker future expectations for cannabis and ecstasy use. These findings provided partial support for the hypothesis that the experience of negative effects discourages future use. Based on data from Study One, it was suggested that the inconclusive results could indicate a variety of responses to the experience of negative effects (e.g. acceptance, modification of behaviour or abstinence), which might depend on the results from individual cost-benefit analyses. A number of gender and age interaction effects were identified in the regressions via moderator analyses. Finally, mediator analyses revealed that the apparent negative relationship between age of first use and problems was explained (mediated) by current intensity of use.

6.2.4 Overview of the methods used

As noted in Chapter One, a large body of literature exists on initiation and experimental substance use in adolescents and on the dynamics of dependence in adult treatment populations of drug users. Much less common is research that has examined transitions between experimental use and regular or problematic patterns of consumption. The current studies aimed to advance understanding in this latter area using a combination of qualitative and quantitative research methods.

Over 500 young people living in southern England were interviewed during the course of this research programme. This makes it one of the largest detailed studies of polysubstance use in young people conducted in the UK since the widespread increase in substance-use prevalence during the 1990s (Ramsay & Spiller, 1997; HEA/BRMB, 1997; Ramsay & Partridge, 1999).

Of particular note was the success of the data collection methods used in Study Three, which demonstrated that it is possible to recruit and train young people to conduct detailed structured interviews with their friends and acquaintances about illegal drug use. This approach facilitated rapid access to a large sample of hidden drug users. It also enabled more detailed datasets to be collected than would have been feasible had a self-completion format been used. In the UK, the use of young people as peer interviewers to access hidden populations of young drug users is a relatively novel approach. This work builds on methods developed during the early 1990s that used adult 'ex' or current drug users to collect data from hidden populations of heroin and

injecting drug users (Griffiths et al., 1993; Power, 1994). Having shown that this type of approach is feasible for collecting data from young people who use alcohol, cannabis, amphetamine, ecstasy, LSD and cocaine, future studies could examine the feasibility of using similar methods to access different hidden populations of young drug users. For example, users of different drug types (such as solvents or heroin) or with particular demographic profiles (such as age or ethnic background) could be targeted. The feasibility of conducting a longitudinal study using peer interviewers could also be explored in subsequent research.

The quantitative measures used in all three studies were uniform across the different drug types (with a couple of minor differences). This allowed across-drug comparisons to be made at the univariate level. It also provided identical sets of variables for use in the regression models for each drug (allowing across-drug comparisons at the multivariate level). Overall, the results suggest that it is feasible to use the same items (with a few exceptions) across very different drug types to assess functions for use, negative effects associated with use, problems and future expectations. While this finding was perhaps to be expected for problems relating to substance use (given the use of uniform items to assess substance dependence disorders in DSM-IV and ICD-10 - see table A1 in appendix A), the approach was relatively novel for the other constructs measured. The adoption of similar uniform measurement principles across different drug types in future work could help to increase understanding of similarities and differences in the mechanisms that determine patterns of substance use in young people.

To date, most studies on substance use in young people have focused on modelling alcohol, cannabis and tobacco use, or have grouped all illicit drugs into combined categories and attempted to model 'drug use' overall (e.g. Bry et al., 1982; Kumpfer & Turner, 1991; Godin et al., 1992; Bailey et al., 1992; Fergusson et al., 1995; Duncan et al., 1998). To a certain extent, the current approach was therefore exploring new territory. A possible criticism of the analytical methods used in Studies Two and Three is that they were over-structured and there was no opportunity for variation in the variables used in the models for each drug type. Had a more flexible approach been used in which the models for each drug were constructed separately, it may have been possible to explain a larger proportion of the variance in scores on the DVs. However, the chosen approach allowed a systematic assessment of a complex set of behaviours across a number of different drug types, which has rarely been attempted elsewhere.

6.2.5 LSD: an exceptional drug?

The general relationships between variables identified in the data were consistent for all drug types with the exception of LSD. Overall, the findings suggested that common mechanisms determined use of the different substance types examined, but that LSD was somehow different. Not only was LSD the least prevalent drug, and relatively few of the lifetime users reported recent use of this substance, it was also associated with the least diverse range of functions for use out of the six drugs studied. Furthermore, compared with the other drugs, average problem scores for LSD were low. These findings could be explained by the relative lack of experience that the interviewees tended to have had with LSD. Given that the average age for initiation into LSD use was broadly similar to that for the other 'dance drugs', and this drug is generally reported to be readily available to young people (Parker et al., 1998), other factors are likely to have contributed to the fact that most respondents reported less experience with the drug. A possible explanation is that LSD is fundamentally different from the other drugs studied. There is little evidence for the existence of a dependence syndrome associated with excessive LSD use (ISDD, 1996), and perhaps the mechanisms that inhibit escalation in use and the development of associated problems differ substantively from the other drugs studied. For example, if an average dose is consumed on three to four consecutive days, rapid tolerance to the effects develops. The user must then abstain for several days before sensitivity to the drug effects returns (Tyler, 1995). This is a unique property, not shared by any of the other drugs studied. However, a third interpretation of the findings is that different results were obtained for LSD due to a lack of available cases for analyses. The sample size for recent LSD users in Study Three was less than half that for the other drugs and consequently only relatively strong effects could be reliably detected by the analyses. More work is required in this area, using larger samples of LSD users to explore patterns of use and functions.

6.3 Limitations

Before considering the wider implications of the research findings, this section discusses some of the shortcomings of each of the three studies. A number of these issues have already been identified in the preceding chapters. However, this section focuses on limitations that spanned all three studies and suggests how future studies could be improved.

The fact that all three studies were cross-sectional rather than longitudinal was a crucial limitation to this work. For example, longitudinal designs would have enabled actual changes in drug use rather than future use expectations to be modelled. Longitudinal data would have also provided the opportunity to examine the causal direction of some of the relationships noted in the data. In particular, analyses to determine whether or not negative mood functions precede problems relating to the use of a drug (or vice versa) would have been supported. However, longitudinal studies are extremely resource intensive. Furthermore, they are vulnerable to sample attrition which can bias analyses. A relative advantage of the cross-sectional methods used was that it was possible to access a large number of 'hidden' drug users within limited resources. Given the exploratory nature of the research programme, this was particularly appropriate. However, future work should consider the relative benefits of a longitudinal design to develop work in this area further and to help map the impact of functions on drug-using careers.

Another limitation discussed earlier in this thesis (see sections 4.4.6 and 5.4.9) was the non-random nature of the samples used. Consequently, the extent to which the findings are representative of the wider population(s) from which they were drawn is unknowable and the data should be interpreted with this in mind. However, there are no formal sampling frames for hidden behaviours such as illicit drug use. Had random samples from the general population of 16-22 year olds been used, several thousand cases would have been required to ensure that sufficient data on recent use of the less common drugs (such as cocaine or ecstasy) were available for modelling. This would have been far in excess of the available study resources. Given that a random sample was not feasible, the sampling methods used were appropriate.

A limitation identified in several other UK-based studies of drug use in young people is that they have employed samples drawn from university populations, which result in a disproportionately high level of education (e.g. Wright & Pearl, 1986, 1990; Ashton & Kamali, 1995; McMillen, 1997; Webb et al., 1998). In contrast, methods used in the current research programme ensured that the samples used were more balanced. For example, in Study Three, the use of a combination of methods to access a diverse range of interviewers (from a variety of backgrounds and levels of education), who then acted as starting points for snowball samples, helped to ensure that the sample obtained was similarly varied. Nevertheless, the extent to which the current findings would be

applicable to the wider hidden population of young drug users is unknowable and consequently care should be taken not to over-generalise the results.

Other limitations of the current research programme concern the measures used. As discussed previously, the fact that all the studies relied solely on self-report measures could raise concerns regarding validity. Self-report measures hinge on the assumption that respondents not only accurately report what they believe to have occurred ("veridicality" - Bonito et al., 1976; Nurco, 1985), but also that they have an accurate recollection or understanding of occurrences to report on. Substance use may hamper accurate reporting as it can affect recall of events. Respondents may also be inclined to 'edit' occurrences due to the illegal nature of drug use, or in response the demand characteristics of the interview situation. Data were also vulnerable to the effects of 'self-serving bias', post-hoc cognitive consistency and false rationalisation. Self-serving bias refers to the tendency for individuals to take credit for behaviours they regard as successful or positive and to attribute unsuccessful behaviours to external circumstances (Brown, 1986). It is possible that respondents chose to endorse what they perceived as positive functions for substance use instead of reporting accurately. Similarly, data may have been affected by (conscious or subconscious) efforts to make behaviour appear reasonable after the event. Thus, if use of a drug had been particularly heavy, the functions for use reported afterwards may be adjusted to make the high consumption appear rational to the user (post-hoc cognitive consistency). Thirdly, 'false rationalisation' refers to the possibility that reports might have been modified to rationalise what was actually irrational behaviour. While it is unclear how all of these potential biases could be controlled, subsequent research could collect test-retest data to establish the stability of key variables over time. Furthermore, collateral data from peers could be gathered to improve measures pertaining to their substance use. This would also allow the role of actual peer use compared with perceived peer use to be examined in the models. However, many of the limitations mentioned above are inherent in research in this area and cannot be readily overcome.

A further potential limitation with the measures used in Studies Two and Three is that several of these consisted of single items. This is likely to make the measures less reliable than if multiple items had been used (Baron & Kenny, 1986). For example, a composite future use measure could have been constructed from three items measuring future i) intentions, ii) expectations and iii) desire, as suggested by Conner & Sparks (1997). Examples of such items include: i) Do you intend to use cannabis in the next

year? (rated on a seven-point scale: 'definitely do not' to 'definitely do'); ii) How likely is it that you will use cannabis in the next year? (seven-point scale: 'very unlikely' to 'very likely'); iii) Would you like to use cannabis in the next year? (seven-point scale: 'definitely not' to 'definitely'). Although conceptually preferable, the comprehension of the subtle distinctions between such measures is complex and could therefore generate more problems than benefits. For example, if respondents perceive the three questions to be the same, they may become irritated by the repetition. This could result in them becoming less motivated to provide accurate data and to complete the interview, which would compromise the data collected. In contrast, the measures used in the current research instruments had the advantages of brevity and simplicity.

Most of the variables included in the main analyses could be described as 'internal' or 'cognitive' markers of risk. However, it is important to acknowledge that there are numerous external risk markers as well as additional internal factors which were not assessed. For example, issues that were not covered include drug knowledge, criminal behaviour, peer deviance, genetic factors, parental influences and neuro-cognitive deficits. However, increasing the number of variables examined would have also had disadvantages. The duration of the already lengthy interview would have been increased, thus risking more missing data, a lower participation rate and perhaps reduced data accuracy due to participant boredom or fatigue. Furthermore, a larger set of independent variables would have required a corresponding increase in sample size to support the multivariate regression analyses. For example, Tabachnick and Fidell (1996) recommend the following formula for calculating the number of cases required: $N>50+8m$ (where m is the number of IVs). Thus, had an additional 20 variables been used, at least 354 users of each drug type would have been required for the analyses. On the other hand, important factors may have been omitted that future studies could address.

Overall, given the above limitations and those discussed elsewhere in this thesis, the results have a number of important practical implications. The next section in this chapter reviews the original research questions. Following this, the implications that the study findings could have for understanding substance use in young people are considered. This is followed by a discussion of some ramifications that the findings could have for drug prevention, interventions and policy.

6.4 Review of the research questions

Four research questions were identified in Chapter Two. This section reviews each of these questions in turn and presents a brief summary of how they were addressed and the key findings that relate to them.

Q.1. What factors do young people cite as influencing their substance use?

This was the underlying question addressed in Study One. A range of influences was identified, including gender, drug availability and peer use as well as cognitive influences such as expectancies, negative effects and functions for substance use. These findings formed the basis of the subsequent investigations that used quantitative methods to model the way in which specific factors influenced patterns of substance use.

Q.2. Is it feasible to measure 'functions' for the use of <u>different</u> substances using the <u>same</u> set of measures?

Five categories of function were identified in Study One. These findings were used to develop items to measure functions for drug use that were tested on six drugs in Study Three: alcohol, cannabis, amphetamines, ecstasy, LSD and cocaine. Only one item differed between drug types: *"to sleep"* was replaced by *"to lose weight"* in the scales used for the three stimulant drugs. Overall, there was evidence to support the use of the same set of measures across different drug types (with this one exception).

In Study Three, no evidence for a consistent structure across the six drug types was found via PCA. It was suggested that this finding was perhaps unsurprising given that the function items were developed to measure 18 <u>different</u> functions for drug use rather than to act as different measures of the <u>same</u> underlying construct. However, the extraction of two subscales to measure Negative Mood Functions (NMF) and Social Functions (SF) was supported and these subscales were shown to have acceptable internal reliability (using Cronbach's alpha coefficients) for all drugs, with the exception of LSD for the NMF scale and LSD and cannabis for the SF scale. In summary, the findings indicated that it was generally feasible to use the same set of measures to assess functions for the use of different drug types and that these measures showed acceptable internal reliability.

Q.3. Can functions for substance use help to explain patterns of consumption, associated problems and future use expectations regarding a range of drugs commonly used by young people in the UK?

This question was explored in the data via regression analyses. In all cases, functions for substance use were found to make significant contributions to explaining patterns of consumption, problems and future expectations for alcohol, cannabis, amphetamines, ecstasy and cocaine, when other key variables such as peer use and intensity of use were controlled. There were insufficient recent LSD users in the samples to examine this question for this drug at the multivariate level. However, evidence from the bivariate correlations suggested that the mechanisms underlying patterns of use for this drug may be different from the other drugs studied. Overall, the results suggest that recognising that substance use can serve specific purposes for the user, which can be measured, could help to explain patterns of use as well as the relationship between current use, problems and future expectations for the target drugs.

Q.4. What impact does the experience of negative effects have on substance use?

The results pertaining to this last research question were less clear. Study One identified three potential responses to the experience of negative effects in association with substance use. Respondents either i) accepted negative effects as an unavoidable consequence of substance use, ii) modified their behaviour to reduce the likelihood of future negative effects or iii) abstained from future use. The second study developed and tested a three-item negative effects scale based on the findings from Study One. Although results suggested that these items formed a reliable scale for the target drugs, there was no evidence for a significant relationship between scale scores and patterns of use or future expectations for any of the drugs. In Study Three an extra item was added to the scale and the time-frame was modified to 'past year' rather than 'lifetime'. However, these changes did little to generate support for the hypotheses regarding negative effects. Little evidence for a consistent relationship between this variable and current patterns of use was found for any of the drugs studied. Furthermore, although negative effects were generally strongly related to problem scores, they made little contribution to explaining the variance in scores on this variable over and above the other variables examined. In contrast, in the analyses of future use expectations some weak predictive associations were noted: higher negative effects scores in cannabis and ecstasy users related to weaker future expectations. Similar associations were observed

between negative effects and future expectations for amphetamines and cocaine, but were not sufficiently large to reach statistical significance. Overall, the results suggest that the relationship between negative effects and substance use is complex and likely to depend on a range of other factors which are weighed up against each other by the user. The use of a 'cost-benefit analysis' framework for understanding this relationship was suggested and this is discussed in more detail in the next section.

6.5 Implications for understanding substance use

Developing an understanding of how factors interact to influence patterns of use and the development of subsequent problems, could open up new avenues for prevention and intervention approaches and is consequently an important goal for research. This section considers how findings relating to some of the key variables identified in the data could contribute to this process.

6.5.1 Functions for substance use

Evidence that functions for substance use can be measured and that they relate to patterns of use, problems and future expectations in a regular way across different drug types has been presented in this thesis. These findings provide support for the argument that functions can help to explain substance use in young people. During the past 20 years, a substantial body of research has focused on the measurement of substance-related expectancies (e.g. Christiansen & Goldman, 1983; Brown, 1985; Smith et al., 1986; Mooney et al., 1987; Roehling et al., 1987; Stacy et al., 1990; Schafer & Brown, 1991; Wood et al., 1992; Jaffe & Kilbey, 1994; Stacy et al., 1995) and how such measures relate to use. However, as argued previously (see Chapter Three), expectancies can be held without resulting in use (Mulford, 1983). In contrast, functions for substance use are more proximal to behaviour. Evidence from the current research could support an argument for measuring functions instead of expectancies in populations of current users, particularly given possible confusions between 'reasons', 'motivations' and 'expectancies' noted in Chapter One. Clearly, this would be inappropriate in non-using samples as, by definition, functions for use must follow initiation. Functions have been shown to relate to patterns of behaviour in a similar fashion to these constructs. Future work in this area should further develop and test function measures in a similar way to work described in the expectancies literature (e.g.

Fromme et al., 1993; Jaffe & Kilbey, 1994; Stacy et al., 1990, 1995). In contrast to the expectancies approach, the feasibility of using common items across drugs to measure substance-related functions could be examined together with the possibility of adding extra drug-specific items. Furthermore, the relative predictive validity of functions could be compared with expectancies in future studies.

A key finding was that function scores added to the proportion of variance in problem scores explained by intensity of use. This indicates that function measures could add additional detail to traditional profiles of substance users, which have tended to focus on drug type and frequency and quantity measures. This could enhance efforts to understand similarities and differences between substance users and possible future outcomes. For example, it may be possible to identify groups of individuals who are at higher risk of future heavy or problematic use by profiling early use on these dimensions. In particular, the current findings suggested a possible link between using to fulfil negative mood functions and problems relating to use.

It has been suggested elsewhere that different reasons or motivations for substance use may relate to different subsequent outcomes, such as problems with use (e.g. Carman, 1979; Glynn et al., 1983; Stein et al., 1987a; Newcomb et al., 1988; Bradley et al., 1992; Thombs & Beck, 1994). For example, individuals who use drugs to reduce negative affect may be at greater risk of adverse consequences than those who use for purely social reasons (Newcomb et al., 1988). Bradley and colleagues (1992) demonstrated that when alcohol consumption levels were controlled in a sample of college students, personal/psychological motives for use and social/convivial motives predicted problem scores independently. Evidence from Study Three suggests a link between negative mood functions (similar to Newcomb et al.'s negative affect motivations) and problem scores. A number of interpretations of this finding are possible. People who have begun to develop problems with a drug could be more likely to choose to use this particular substance to help them to relieve negative mood states. Alternatively the opposite could be true: that using drugs to fulfil this type of function is a precursor to developing problems relating to use. Thirdly, the relationship could be reciprocal, with both factors influencing each other in some way.

At present, there is very limited understanding of how different factors relate to the development of substance-related problems in young people. Studying functions related to use could be a promising avenue for future research. In particular, the nature of the link between negative mood functions and problems requires further replication

and investigation using different samples of substance users. However, if these observations are indicative of an underlying relationship between these two constructs, there could be merit in examining the feasibility of using this relationship as a reliable means of identifying individuals at risk of future problems with their substance use. At a time when substance use among young people is common in the UK (HEA/BRMB, 1997; Ramsay & Partridge, 1999; Goddard & Higgins, 1999), being able to identify those most at risk could facilitate resource allocation for maximum effectiveness.

The finding that functions explained substantial proportions of variance in patterns of consumption, over and above that explained by peer substance use, underlines the importance of recognising the purpose that use serves individuals in addition to social-environmental factors. Traditionally, peer substance use has been one of the most common factors discussed in research on drug use in adolescents and young people (e.g. Kandel et al., 1978; Huba et al., 1979; Battistich & Zucker, 1980; Jessor et al., 1980; Elliott et al., 1985; Barnes & Welte, 1986; Kandel et al., 1986; Kandel & Andrews, 1987; Lopez et al., 1989; Brook et al, 1990; Swadi, 1988, 1999). However, the current studies have provided evidence that functions for use could make substantial additions to peer-use variables in research efforts that aim to model and understand drug-using behaviour in young people.

Using a functional approach to studying drug use could help to explain patterns of polydrug use and concurrent drug use. In the current thesis, 'polydrug use' has been used to refer to the use of several different drugs over a short period of time (e.g. three months) while 'concurrent use' has described the use of two or more different substances at the same time (Boys et al., 2001b). The results from all three studies indicate that different drugs can be used to fulfil a variety of functions: an individual might choose alcohol to help them to relax after work, cannabis to aid sleep and amphetamines to help lose weight. There was also evidence to suggest that different drugs can fulfil the same or very similar functions and some drugs may be used interchangeably. Such choices were often dictated by availability constraints. These findings could help to explain the motivations for polydrug use – why an individual uses different drugs at different times and within different contexts rather than always choosing to use ecstasy, for example.

Similarly, a functional approach could help us to understand 'concurrent' substance use. Study One indicated that decisions concerning the use of one drug were often closely intertwined with the use of at least one, or several others, as certain drugs

were used to manage or enhance the effects experienced from other substances. Empirical evidence for this practice was gathered in Study Three, where two widely endorsed function items were using a drug *"to help enhance the effects of other drugs"* and using *"to help relieve the after effects (or 'come down') from drug use"*. Recent research has noted similar practices in other samples of young substance users (e.g. Nabben & Korf, 2000; Boys et al., 2001), particularly after the use of ecstasy, amphetamines or cocaine. By examining functions for substance use, it is possible that a better, more sophisticated understanding of what motivates such behaviours could be gained and appropriate responses more easily identified. For example, much of the harm reduction literature has proffered relatively simplistic messages advising users to avoid mixing drugs because the interactive effects may be dangerous (e.g. HIT, 1996). This "Just Say No" type of approach is perhaps unlikely to be heeded if the behaviours in question are serving important functions for the user (e.g. reducing anxiety when using cocaine). If the motives behind mixing drugs were better understood, perhaps more meaningful messages could be developed and if possible, safer alternative behaviours suggested. In particular, where appropriate, prevention initiatives could be developed around dangerous combinations.

The recognition of functions for substance use could also contribute to explaining links noted elsewhere in the literature between specific demographic characteristics (such as gender or unemployment) and patterns of consumption. For example, Hammer & Vaglum (1990) reported a positive link between unemployment and alcohol and cannabis consumption in men. It is possible that this group of users were consuming alcohol and cannabis to fulfil similar functions to help them to deal with their unemployment (such as using to help stop worrying about problems, or to relieve feelings of depression or boredom). Similarly, it could help to explain why members of certain 'vulnerable' groups of young people are at high risk of developing drug-related problems (Lloyd, 1998). For example, the high prevalence of substance use noted by Fountain & Howes (2001) in a sample of people sleeping rough in London could be due to use fulfilling functions such as helping to cope with the cold, aiding sleep or helping users to deal with other circumstances connected with their homelessness. It is possible that common functions underpin substance use within (and across) these 'vulnerable' groups. Furthermore, explanations of why some individuals within these groups appear to be resilient to developing substance-related problems despite being categorised 'at risk' could also be enhanced. For example, one adolescent

who has been cared for by social services (and who was consequently a member of a vulnerable group) might use amphetamines once a week when out with friends with the primary functions of staying awake all night and having lots of energy to dance. It is not difficult to imagine that another adolescent from local authority care, who has just discovered that this drug helps them to feel better when they are feeling depressed, to forget their problems and to feel more confident, might be at higher risk of escalating use and developing amphetamine-related problems.

In summary, the potential implications of using a functional approach to explaining substance use are considerable. However, research in this area is in its infancy and consequently many of the suggestions offered above are largely speculative. There is a clear need for further replication of the relationships between variables noted in this thesis, as well as more widespread investigations using other populations of substance users before these ideas can be asserted with confidence.

6.5.2 Negative effects

The hypothesised relationship between negative effects and patterns of use was not supported in the data analyses and there was only weak evidence that greater experience of negative effects was linked to weaker future expectations. The findings from the qualitative study have been highlighted as potentially useful in helping to explain these results. If at least three potential responses to the experience of negative effects from substance use exist in young substance users (i. acceptance, ii. behaviour modification or iii. abstention), it is unlikely that a simple scale measuring the frequency of experiencing such effects over the past year will have a consistent relationship with patterns of recent use or future expectations. While the negative effects measures used were appropriate for assessing responses i) and iii), which are consumption based, response ii) was more challenging as modifications could have occurred in areas other than simple frequency of use or typical amount used. For example, behavioural modifications might take simultaneous substance use into account (e.g. using less/abstaining from cannabis after drinking alcohol) or more subtle factors such as current state (e.g. not using cocaine on an empty stomach). In such cases a straightforward relationship between negative effects scores and patterns of use would not be observed. Had additional measures of severity and incidence of the negative effects been included, it is possible that the analyses would have revealed clearer relationships in the data. The results indicate that the link between negative effects and

patterns of substance use in the sample was complex and suggest a need for more sophisticated measurement techniques in future studies (addressing dimensions such as severity) to unravel this relationship further.

The findings relating to negative effects provided some insight into how drug-related expectancies can be modified and refined as young people learn to use drugs. For example, Study One described a complex process through which expectancies appeared to become more sophisticated when factors such as dose, concurrent substance use or current state were taken into consideration, often after the experience of negative effects. These findings could call into question suggestions that expectancies are generally stable over time (Goldman et al., 1991) and are similar to trait-like beliefs (Young et al., 1990), at least within this type of population.

Overall, there was strong evidence to support the use of 'cost-benefit analysis' to help understand how young people make decisions about substance use (Parker et al., 1998). Factors such as negative effects, which represent 'costs' to an individual (in addition to factors such as effort required to obtain drugs or money expended), may be outweighed by the anticipated benefits from use and so the decision to consume a drug will occur. The relative balance between costs and benefits is likely to vary substantially even across a limited time period such as a week. For example, the timing of commitments such as work or study could tip the balance in favour of abstention from substance use at certain times of the week or make the use of a particular drug type more likely than another (Boys et al., 1999b, 2000a). Further research is required to examine the extent to which a cost-benefit framework can be usefully employed to predict drug consumption.

6.5.3 Peer substance use

The findings presented from the three studies support the widely acknowledged relationship between peer substance use and individual patterns of consumption. However, contrary to 'peer cluster theory', which regards adolescents' substance use as directly influenced by their closest friends (Oetting & Beauvais, 1986, 1987) and only indirectly by psychosocial factors, other factors were found to influence consumption over and above peer use. For example, analyses showed that functions for substance use had a significant impact on the DVs when peer use was controlled. This finding could have arisen from weaknesses in the peer use variables used, which perhaps did not permit the true influence of peer factors to be assessed adequately. However, if

similar relationships are found in future studies this could suggest that less emphasis should be placed on the relationship between peer and individual use and more on the influence that psychosocial factors have on patterns of consumption.

The hypothesis that the substance-related behaviours of an individual's partner or best friend impact on individual consumption patterns more strongly than the wider peer group (particularly for drugs other than cannabis and alcohol) was not supported in the main analyses. However, it should be noted that the measures used were relatively simplistic (just one item for each drug) and assessed the respondent's perceptions of the substance use of their peers rather than actual peer use or peer attitudes. These measurement limitations could have prevented stronger support for the hypothesis from being observed. Consequently the findings should be interpreted with care, as the relationship between individual and peer substance use is likely to be complex. To date, few studies of substance use in young people have made similar distinctions between different members of an individual's peer group. The fact that some differences in effects were observed in the results from Study Three could suggest that efforts to measure the influence of best friends/partners separately from the wider peer group are worthwhile. Subsequent studies should examine these variables using more rigorous measures (and possibly collateral data from the individuals concerned) to further understanding regarding the relative importance of partners, best friends and peers in influencing substance use. Sub-divisions of the peer group could also include 'close friends'. Furthermore, the use of 'social network analysis' (Bauman & Ennett, 1996), where individuals are asked to name their friends and then overlapping links between reports are used to identify friendship networks, could be valuable in examining the peer-drug-use relationship further.

6.5.4 Gender and age

Gender differences in consumption patterns were evident across all three studies, both in types of drugs used and functions for use. The findings were consistent with previous studies that have reported males and females tend to use substances for different types of reasons (e.g. Riley et al., 1948; Johnston & O'Malley 1986). Evidence to support the conjecture that there are underlying differences in the ways that males and females make use of drugs and the role that substance use plays in their lives was noted in addition to indications that developmental differences in functions for substance use may exist. For example, in Study Three, interviewees who had used

cannabis in the last year *"to feel elated"* or *"to sleep"* tended to be older, while respondents who had used it to *"stop worrying"* were younger than those who reported other functions for use. These results could indicate that as young people emerge from adolescence into young adulthood, the ways in which they use drugs change, and in particular, their functions for substance use alter (e.g. Newcomb et al., 1988; Novacek et al., 1991). If further research (from both cross-sectional and longitudinal studies) provides additional support for these results, it highlights the importance of taking age into consideration when comparing findings across studies, as age differences could confound conclusions.

In addition to the bivariate age and gender effects noted above, considerable evidence for interactions between age and gender and the main variables in the regression analyses was found in Study Three. These findings emphasise the importance of using multivariate analyses to examine data on substance use in young people and moderator analyses to search for developmental and gender effects. Studies that fail to analyse data in this way could miss important patterns in the data. For example, if a variable is positively related to a DV in males only, then if no gender differentiation is made in the analyses, the overall effect will be diluted and may therefore be missed (particularly if the sample size is relatively small).

6.5.5 Age of onset

In the current research, the average age of onset for the drugs studied ranged between 13 and 17 years. These findings are similar to those reported elsewhere (Segal, 1986b, 1991; Miller & Plant, 1996; White & Pitts, 1998) and add further support to the view that most drug experimentation takes place during the early teenage years.

The consistent negative relationship noted between age of onset and problem scores for the target drugs suggests that people who first use a drug at an earlier age are at greater risk of subsequent problems than those who are older at initiation. These findings are consistent with reports from other studies in the drug and alcohol literatures (e.g. Kandel, 1982; Fleming et al., 1982; Robins & Przybeck, 1985; Labouvie & McGee, 1986; Kandel & Davies, 1992; Breslau et al., 1993; Stenbacka, et al., 1993; Hall et al., 1994; Anthony & Petronis, 1995; Ferguson & Horwood, 1997). Two possible interpretations of this relationship were discussed in Chapter One (section 1.7.2). First, as suggested by Jessor and colleagues (1980), the link could arise due to early use being an indicator of a range of factors that predispose young people to

problem behaviours. Alternatively, Kandel and associates have proposed a more causal relationship in which early onset initiates a chain of events that result in a range of negative consequences (Kandel et al., 1986). The mediator analyses reported in Chapter Five suggested that for all drugs, the apparent relationship between age of first use and problems was explained by variance in intensity of use. This implies there was little evidence to suggest that age of onset directly influences problems. These findings could call into question the usefulness of prevention targets such as delaying age of first use by six months (UKADCU, 2000). It seems that a direct causal relationship between early onset and subsequent negative outcomes is unlikely. It is therefore unclear what benefits a six-month delay might accrue, particularly if Jessor and colleagues' viewpoint (Donovan & Jessor, 1985; Jessor et al., 1986) is accurate. In contrast, if the stance adopted by Kandel et al. (1986) is more accurate, perhaps the target is appropriate. Further research is required to determine which of the above interpretations is more likely to explain the relationship between early onset and problems with use. Age of first use acts as an indicator of the length of a drug-using career. It therefore seems that those who had been using the drugs for longer, tended to be heavier current users, and heavier current users tended to have higher problem scores. If the primary goal is to reduce the problems associated with drug use in young people, the current data suggests that efforts would do better to focus on more proximal influences, such as patterns of use or functions, rather than age of onset.

6.5.6 Overview

This section has considered some of the implications that the findings reported in this thesis could have for understanding substance use in young people. First, it was argued that as a more proximal influence to substance use than expectancies, in studies that aim to explain drug use behaviour, functions should be measured. It was also suggested that the systematic measurement of functions could enhance efforts to profile substance use and thus the identification of individuals at high risk of future problems. The potential for drug-use functions to contribute to understanding of polydrug (and concurrent drug) use was also highlighted, in addition to helping to explain use in so-called 'vulnerable' groups.

The argument that the results pertaining to the relationship between negative effects and patterns of substance use support the use of a cost-benefit framework for understanding substance use in young people was then proposed. The process through

which negative effects can lead to the moderation of drug-related expectancies was also discussed.

The penultimate subsection considered the gender and age differences in substance use found in the research results. It emphasised the importance of conducting moderator analyses to examine data on substance use in young people for gender and age interaction effects at the multivariate level. Finally, the relationship between age of onset and future problems relating to substance use was considered. It was suggested that age of onset was a marker of risk, rather than causally related to patterns of substance use in young people. The next section builds on these findings by considering how they could inform practice.

6.6 Practical Implications

The practical implications of the key results described in this thesis can be related to three main areas: i) prevention (and education), ii) interventions and iii) policy. This section discusses the findings as they relate to each of these areas in turn.

6.6.1 Prevention and education

Drug prevention and education in the UK has failed to halt increases in substance use in adolescents and young people during the past two decades (Dorn & Murji, 1992; Brown & Kreft, 1998; White & Pitts, 1998). Breeze et al. (2001) suggested that this poor success could be due to a general failure to understand the processes and mechanisms that influence adolescent substance use. This section considers some of the implications that the current research findings could have for helping to understand these processes and informing developments in this area.

In a recent review of the effectiveness of prevention and education initiatives, White and Pitts (1998) found a notable lack of methodologically sound studies of drug prevention programmes that target illicit drug use in young people. The few that had been rigorously evaluated tended to be school-based, targeting tobacco, alcohol or cannabis, and carried out in the U.S.A. Overall effect sizes were extremely small with an average of just 0.037 at one year. In other words, drug use was delayed (or prevented) in just 3.7% of the young people who were likely to have used drugs during this time period. The authors noted the importance of tracking drug use after the years of compulsory schooling, and concluded that interventions should be matched to the

specific needs and experiences of the target populations (White & Pitts, 1998). The current findings relate to a number of the issues raised by White and Pitts, including i) profiling the target group, ii) developing approaches to drug prevention and iii) improving evaluative methods. These areas are addressed in the following three sections:

6.6.1.1 Profiling the target group

As noted in section 6.5.5, the average age of onset for the drugs studied was broadly consistent with reports in the literature (Segal, 1986b, 1991; Miller & Plant, 1996; White & Pitts, 1998). This further supports suggestions that early adolescence is a key period for targeted drug prevention efforts that aim to both reduce the likelihood of initiation and help young people to make informed decisions about substance use and reducing associated harms.

However, it is important to appreciate the heterogeneity of adolescents and young people. They are likely to differ on dimensions such as drug knowledge, experience of drug offers and patterns of consumption. In the same way that efforts are made to match treatment approaches to certain types of drug users, prevention approaches should reflect the characteristics of the target populations of young people (White & Pitts, 1998). This process could be facilitated by the collection of data to profile substance use and related experiences in groups of young people before planning an intervention. Measuring functions for substance use, in addition to patterns of consumption, attitudes and beliefs etc., could enhance the profile obtained. This could help to increase understanding of the role that substance use plays in the lives of the target population.

6.6.1.2 Developing approaches to drug prevention

The findings from the three studies described in this thesis have a number of implications for approaches to drug prevention in terms of what programmes aim to do and the approach adopted (i.e. aims and content).

i) Programme aims

The first point that arises from the current data and relates to drug prevention aims concerns supply reduction. Evidence from all three studies indicated that different drugs are often used to fulfil the same or similar functions and that some may be used

interchangeably. Data from Chapter Three also suggested that it was not uncommon for an alternative drug to be used when a preferred substance was unavailable. Substitution under such circumstances is perhaps overlooked when supply reduction is considered. While stifling availability is likely to impact on use of specific targeted drug types, if substitution is widespread, such efforts may have limited impact on substance use overall. This is an important issue that could have significant health implications particularly if a more harmful drug is selected when a preferred drug is unavailable.

Secondly, appropriate assessment of the target group (as described above), should help to inform the aims of a prevention programme. However, the extent to which this appears to be executed in the UK varies considerably. For example, a common drug prevention approach has been to set up 'diversionary programmes' that give adolescents the opportunity to engage in enjoyable leisure activities (such as sport, drama or learning to DJ) with the aim of reducing the likelihood that they will engage in drug use (e.g. Davis & Dawson, 1995). Such programmes clearly fulfil an important role, but without taking the functions that drug use fulfils into consideration, the belief that offering an interesting activity once a week will somehow stop drug use could be described as naïve. If, as is often assumed, drug use primarily occurs because young people are bored, then filling their time with alternatives might indeed succeed in reducing drug use (at least for the period of time that they are engaged in the activities offered). However, if, as indicated in the current data, use fulfils a more complex set of functions that are linked to socialising, enjoying music and coping with the stresses and strains of adolescence, then efforts to stop drug use by providing the opportunity to learn to be a DJ seem illogical and over-ambitious. Thus, recognition of the functions that substance use fulfils for a group of young people could help to improve understanding regarding their behaviour and inform appropriate and realistic aims for prevention initiatives.

ii) Programme content

As with a programme's aims, the chosen content and approach should also be informed by an assessment of the target group. Ideally it should be possible to use data on the characteristics of the target group to identify suitable prevention programmes that have shown success (where this evidence base exists) with similar groups of young people. This process would facilitate the process of matching appropriate methods with specific target groups of young people. Once again, the assessment of functions for substance

use could help to enhance this process by providing a more detailed picture of patterns of behaviour within a group. For example, it is possible that young people who primarily use cannabis to relieve boredom would respond better to a programme of alternative leisure pursuits than a group who use the drug to relieve the after effects of stimulant drugs they take at parties and nightclubs. Populations should be compared in terms of variables such as demographics, experience and substance-use profiles. The development of more detailed assessments, which could include similar measures to those used in the current studies, could facilitate this process.

A second implication for informing choice of programme concerns the role of peers in influencing substance use. There has been a tendency for many school-based drug-prevention programmes to assume that peer substance use is the central factor which leads to experimentation and use of drugs. Programmes such as DARE ("Drug Abuse Resistance Education" - Bureau of Justice Assistance, U.S. Department of Justice, 1988) have consequently focused on training young people to resist peer pressure to use drugs, but have shown few positive outcomes (eg. Rosenbaum et al., 1994; Dukes et al., 1996; Lynam et al., 1999). The current findings provide little evidence to support such an exclusive focus on the peer group. Assumptions that peers are the strongest influence on substance use ignore a range of other important cognitive factors and contextual factors such as those measured in the current programme of research. However, two limitations need to be acknowledged. First, participants in the current research were all at least 16 years old and so the results do not represent adolescents of compulsory school age (i.e. under 16 years). Secondly, the studies did not focus on initial drug use and consequently implications pertaining to the prevention of initial use are limited. Nevertheless, unless the social dynamics of substance use change dramatically at the age of 16, over-emphasising the role of the peer group to the exclusion of all other factors is likely to be inappropriate.

The research findings could also have implications for existing health education approaches to drug prevention in young people. Traditionally, health education approaches have focused on specific drug types, and tried to deter use by highlighting potential risks and negative effects associated with use. However, if young people are discouraged from using one drug, there is evidence that they may choose alternative psychoactive substances that are perceived as less risky to fulfil similar functions. For example, it has also been suggested that negative media images and health messages about ecstasy may partially explain recent increases in cocaine use (Boys et al., 1999,

2001b; Breeze et al., 2001). Indeed, recent surveys in the UK have reported that many school-age adolescents now regard ecstasy as more dangerous than heroin or cocaine (Balding 2000; Breeze et al., 2001). Had the functions that underpin ecstasy use been considered, it is possible that this latter outcome might have been anticipated, and this could have stimulated additional measures to prevent cocaine use.

A number of suggestions for alternative approaches to health education can be generated from the current findings. One possibility to try to avoid drugs being substituted in this way is to target groups of similar drugs (rather than isolated drug types). Thus a campaign might aim to discourage the use of all common stimulant drugs, rather than targeting the most common or the most harmful. A more radical suggestion would be to replace the traditional, drug-specific focus with more emphasis on the functions that motivate use. For example, instead of trying to make a drug such as ecstasy seem unattractive through raising awareness of risks and negative effects, the potential physical and psychological impact of taking *any* drug which keeps you awake, increases your energy and results in prolonged periods of dancing could be highlighted. If the aims of an intervention are rooted in a philosophy of harm reduction, the feasibility and potential effectiveness of suggesting alternative, less harmful strategies for fulfilling certain functions could be explored. During the last few years, advertisers have adopted an approach in which the potential functions for the use of the psychoactive drug caffeine have been highlighted to encourage young people to use caffeine tablets and high-potency drinks. The fact that these advertising campaigns have continued suggests that the approach has been successful in boosting sales. Consequently, the possibility that a similar approach could be employed in prevention and education efforts should be considered.

Further implications from the current research findings concern the use of different approaches for different segments of a target population. For example, evidence for potential differences in the role that substance use plays in the lives of young males and females has been noted earlier (see section 5.4.8.1). Gender differences were observed both in patterns of substance use and in the functions fulfilled. For example, amphetamine use was more common in females, while males reported more LSD use. Data from Study One suggested that these findings could be explained by a difference in the types of effects preferred by males and females. The data also indicated that females tended to report more externally goal-directed functions (i.e. linked to social activities or physical gains such as weight loss, or increased

wakefulness), while males were more focused on the drug effects. Similar gender differences in reasons for substance use have been reported elsewhere (e.g. Johnston & O'Malley, 1986). If these differences are found to be widespread within a target population, they should be considered when developing prevention and education strategies to maximise the salience for the target group. For example, health education advertisements in magazines targeting young females might differ from those that target boys of a similar age. Similarly, the age differences noted earlier (see section 6.5.4) suggest a need to vary prevention efforts according to target age groups. For example, the finding that younger users tended to use certain drugs *"to stop worrying"* could suggest a need for more focus on problem-solving or stress-management techniques in prevention activities which target this age group. However, it should not be assumed that the findings presented here will be transferable to other populations of young people. Instead, as previously suggested, these data could be collected via a detailed baseline profile of the target group during the planning stages of a programme

Evidence has been presented to suggest that the young people interviewed made active decisions concerning their substance use and that these decisions were influenced by a variety of factors. It has also been suggested that this process can be conceptualised as a cost-benefit analysis. Parker and colleagues (1995) emphasised the need to ensure that young people are well equipped to make informed decisions about their substance use. In particular they suggested that "*young people need to be equipped with a basic understanding of how drug 'careers' develop and how they can assess themselves in the same way smokers and drinkers can gauge their behaviour*" (p.26, Parker et al., 1995). The feasibility of using a cost-benefit framework to develop strategies to help young people to make informed decisions should be explored. Overall, the results presented suggest the need for a more pragmatic approach to drug education that accepts use has both positive and negative effects. Such an approach is likely to be better at equipping young people with skills to make decisions about use than some existing programmes that focus on negative effects.

The results could also inform the development of methods to encourage young people to appraise their drug-related behaviours, as suggested by Parker and colleagues (1995). This approach could be consistent with recommendations made by Kovach and Glickman (1986) that prevention should focus on raising awareness of factors which influence drug problems. The challenge is to develop appropriate communication channels to deliver such information to those most at risk. One possibility is to develop

written harm-reduction materials that aim to encourage young people to assess their substance use. For example, a leaflet-based 'checklist' could be used to encourage drug users to examine various aspects of their behaviour (including functions for use) and assess their level of risk based on scores assigned to the items endorsed. Recommendations for behaviour modification or service-seeking behaviour could correspond to the items 'checked'. If future studies replicate the link between negative mood functions and problems noted in the current research, and, in particular, if evidence that negative mood functions tend to precede problems is established, this should be communicated to young drug users. Thus the possibility that written materials could be used to encourage users to consider the functions which underpin their substance use, and that this could result in changes in behaviour, could be examined. There is evidence to suggest that young drug users are motivated to stay safe and to minimise drug-related harms (Breeze et al., 2001). Consequently, this type of approach could hold promise for providing an opportunity to encourage behaviours associated with risk to be modified. In this way young drug users could be encouraged to appraise their behaviours and make informed decisions about their substance use based on balanced, factual information.

6.6.1.3 Programme Evaluation

The standard of evaluation of drug prevention initiatives in the literature has been generally found to be lacking (White & Pitts, 1998). In particular, programmes implemented outside of the school environment in the UK have rarely attempted more than process evaluation, so little can be deduced concerning their effectiveness (White & Pitts, 1998). The challenge of finding appropriate methods to measure and evaluate outcomes in such programmes is considerable. If behavioural measures of substance use are used as primary outcome measures, effect sizes tend to be small. However, if programmes are implemented within a harm-reduction framework, they may well result in positive gains without necessarily reducing substance use. The possibility that changes in some of the measures used within the current studies (such as negative effects, problems associated with use and drug-related functions) could be more realistic outcome goals should be considered. An example of this might be aiming to reduce the number of participants who report negative effects associated with their substance use in the past month, or to reduce the proportion who report smoking cannabis to forget about problems. If further research can clarify the links between such measures and problems

relating to use, the pursuit of such outcomes would be strengthened as this could help to prevent transitions from regular to problematic use. However, at present, the evidence base is insufficient to support such suggestions.

The failure of many non school-based programmes to collect pre- and post-intervention outcome data could be due, in part, to the challenges presented by conducting research in hidden populations of young drug users (White & Pitt, 1998). A lack of funding could have also contributed to this situation. The methods used for accessing and interviewing drug users in the current research programme could potentially help to overcome these difficulties. The use of peer interviewers and snowballing techniques could facilitate access to people within the group targeted by a programme and enable data to be collected from a relatively large sample within limited resources. Furthermore, the feasibility of using such methods in a longitudinal study (which gathered pre- and post-intervention data from the same individuals) could be explored.

6.5.1.3 Overview

This section has examined how the present findings could inform drug prevention and education in the UK. The lack of a well-evaluated evidence base for prevention was highlighted. Implications for profiling target groups, developing approaches to drug prevention and improving evaluation methods were then discussed. In particular, the role that measures used in the current research could play in assessing target populations during the planning stages of an intervention was emphasised. Collection of such data could help in the identification of realistic aims for a programme and the selection of appropriate methods and content, and would also provide baseline data for evaluation purposes. It was suggested that health education initiatives could consider the possible benefits of adopting 'function-focused' rather than 'drug-focused' approaches to help tackle the issue of substitution. Efforts to encourage young drug users to appraise both positive and negative sides to substance use based on factual information were also considered. Finally, it was suggested that the quality of programme evaluations could be improved if measures from the current studies were used as outcome indicators and similar methods were employed for data collection.

6.6.2 Assessment and interventions

The key aim of this thesis was to model patterns of drug-related behaviour and problems in young people. The purpose was to enhance understanding of factors that influence patterns of use and the transition to problematic use. Sutton (1998) noted the distinction between studies that aim to predict behaviour and those which try to explain it. The latter enable high-risk target groups to be identified as well as helping to inform the nature and content of interventions to be used. This section highlights some of the implications that the study findings could have for the identification and assessment of high-risk young substance users and the development of appropriate interventions.

6.6.2.1 Functions

According to the regression analyses, functions for drug use can help to explain behaviour, and negative mood functions, in particular, are strongly linked to substance-related problems. This could have important practical implications for working with young drug users during the early stages of their substance-using careers. For example, instruments designed to profile patterns of substance use in young people could perhaps be enhanced by the inclusion of function measures in addition to more common measures of frequency, quantity and problems associated with use. This would add another measurement dimension, thus facilitating more sophisticated and detailed assessments that could screen for high-risk behaviours in young people. For example, it could be the case that young people who use drugs to fulfil negative mood functions but who have low problem scores are at greater risk of developing dependence problems than those who have similar use and problem profiles but use for alternative functions. Similarly, early onset of the use of drugs to fulfil negative mood functions could be an indicator of subsequent risk. Longitudinal studies are required to investigate these speculative relationships further. In particular, the predictive validity of functions for substance use could be examined. Overall, the development of function components for use in assessment could potentially help professionals to identify young people who might be at increased risk of developing problems associated with their future substance use.

A further advantage of developing assessment procedures in this way is that efforts to match interventions and treatment approaches to specific types of drug users could be enhanced. It has been noted elsewhere that a unitary treatment approach is unlikely to be equally effective with different types of drug users (e.g. Segal, 1986).

Functional profiles could be used to help match appropriate interventions to different 'types' of user. It may be possible to use functions to characterise distinct subgroups of drug users who have different predictors, outcomes and natural histories. For example, people who use a particular drug primarily for social functions may have quite distinct characteristics from those who use it primarily to relieve negative mood states, and thus may respond differently to specific interventions (as well as having different educational and prevention needs).

Functions for substance use are likely to be among the cognitive factors that mediate the influence of risk factors on drug use (Newcomb et al., 1988, 1983). Although the literature identifies risk factors that interventions cannot hope to change (such as having separated parents), the cognitive mediational links between such factors and behaviour may provide an opportunity for intervention. If an evidence base for these assertions can be established in future research, it could open up potential avenues for interventions. As noted in Chapter One, there is a substantial literature linking substance-related expectancies to consumption (e.g. Christiansen & Goldman, 1983; Brown, 1985; Smith et al., 1986; Mooney et al., 1987; Roehling et al., 1987; Stacy et al., 1990; Schafer & Brown, 1991; Wood et al., 1992; Jaffe & Kilbey, 1994; Stacy et al., 1995). A number of researchers have suggested that the manipulation of expectancies (for alcohol in particular) could lead to changes in behaviour and is therefore a potential strategy for treatment, although further research is required to establish a firm evidence base for this assertion (Jones et al., 2001). Having previously argued that functions are a more proximal influence on behaviour than expectancies, the findings from the current studies could suggest a similar strategy, but trying to influence functions for use. Thus the potential impact that such an approach might have on consumption levels could be examined in future research.

A common problem noted in drug treatment is how best to work with the problematic polydrug user. There has been a tendency to try to identify a 'primary' drug to focus on, rather than addressing all use (including alcohol) simultaneously. The recognition of functions that underpin drug use could be particularly useful here as it would facilitate a focus on the motives that underlie consumption, rather than the actual substance used (which may vary depending on factors such as availability). This type of functional approach to working with substance use fits within a motivational interviewing approach to drug treatment (Miller & Rollnick, 1991). It would allow a focus on factors that relate to a behaviour rather than the actual drug being consumed.

While not formally recognised, it is likely that many practitioners already use methods in which functions for use are examined. For example, to a certain extent, a functional approach also fits within the Regulation of the Cognitive States model (RCS, Toneatto, 1995) of treating substance use problems. This approach emphasises the role that drugs have in modifying undesirable cognitive states. Treatment thus aims to help users to develop alternative ways of responding to cognitive states that do not involve substance use. Future studies could examine the utility of employing a functional approach in treatment plans and suggest a more systematic assessment of what may already, to some extent, be practiced.

6.6.2.2 Negative effects

This chapter has already argued that the findings regarding negative effects could support the use of a cost-benefit framework for understanding substance use in young people. Possible implications that using such a framework might have for prevention and education have also been discussed (see section 6.6.1.2) However, this approach could also have specific implications for drug-related interventions that target young people. For example, there is a close similarity between what has been described here as a 'cost-benefit approach' and what in the context of substance-related interventions has been referred to as 'decisional balance' (Janis & Mann, 1977; Miller & Rollnick, 1991). In this, users are encouraged to discuss the both short- and long-term advantages and disadvantages associated with their consumption behaviours. In particular, they are encouraged to consider the experience of negative effects against the perceived benefits from use. This type of approach is currently being tested as part of a brief intervention with young stimulant users in London (Stillwell et al., 2000). Users are encouraged to write lists of positive and negative things relating to their consumption and then consider the implications if their use continues in the future. If appropriate, they are encouraged to formulate intentions for future use (e.g. to modify, reduce or terminate) and then plan how to realise these goals. The findings from the current studies provide further support for exploring use of this type of intervention approach with other groups of young drug users.

6.6.2.3 Summary

This section has suggested some implications that the findings from the current programme of research could have for practice. First, it was suggested that assessment

instruments designed for use with young people could be enhanced by the inclusion of function measures. This might help efforts to identify high-risk users and match specific interventions with certain user profiles. The possibility of examining the potential for manipulating functions for substance use to have an impact on consumption levels was also raised, in addition to the use of a functional approach for working with polydrug users. The use of a cost-benefit approach in brief interventions with young drug users was reviewed and it was suggested that this approach should be tested more extensively within different drug-using populations.

The next section sets the findings within the context of current UK drugs policy and discusses possible implications for future directions.

6.7 Policy implications

Chapter One included an overview of current UK drug policy and noted the following target relating to young people: "*to reduce the proportion of people under the age of 25 reporting the use of illegal drugs in the last month and previous year substantially and to reduce the proportion of young people using the drugs which cause the greatest harm – heroin and cocaine - by 25% by 2005 and by 50% by 2008*" (p.15-16, UKADCU, 2000). An additional target for 2002 is to *"delay the average age of first use of class A drugs by 6 months"* (p.15-16, UKADCU, 2000). With regards to service provision for young drug users, the following aim is detailed in the recent "Young Person's Substance Misuse Plan" (UKADCU, 2001): by 2004, *"...there will be substance misuse education and information [available] to all young people and their families; advice and support targeted at vulnerable groups; early identification of need; and tailored support to all those who need it when they need it"* (p.3). This section considers the potential implications that the findings described in the current thesis could have for contemporary drug policy in the UK.

Although none of the three samples studied could be described as representative of the 'youth' population of the UK, there is a lack of regularly conducted, well co-ordinated national surveys of drug use of sufficient sample size against which the sample characteristics could be compared. This also makes monitoring progress towards Government targets problematic. The British Crime Survey contains a module on drug use, but although the overall sample is large (approximately 10,000), in the last report only 500 of these were aged between 16 and 19 years (Ramsay & Partridge,

1999). Consequently little reliable data on regional variations in drug use in young people is available. There is a clear need for a systematic drug-use monitoring survey similar to the yearly household survey of drug use carried out in America (Adams et al., 2001). Such a survey would enable the impact of drug intervention strategies to be monitored by providing baseline and post-intervention data for targeted areas. It would also provide a valuable source of information for policy planning at a national and local level. At present, key planning documents are forced to rely on fragmented data from studies of varied quality to piece together a picture of regional and national needs in young people (Bamford et al., 2000). A national monitoring system would ensure that a uniform dataset was available for all areas thus enabling better-informed decisions regarding allocation of resources and services to be made. It would also provide a national picture of substance use against which smaller, detailed studies, such as those described in this thesis, could be compared.

Evidence from Study Three indicated that a substantial proportion of users of drugs other than those mentioned in the drug strategy (heroin and cocaine) had experienced problems related to their use. The implications of this are two-fold.

First, it seems that the drug strategy has understated the importance of such drugs in the population of young drug users in the UK. There is a need for use of drugs other than heroin and cocaine to be recognised and targeted as the current data suggest that use of these drugs is not problem free. This raises an additional issue: the lack of policy relating to secondary prevention within the current strategy (Breeze et al., 2001; Measham et al., 2001). While there is a move towards developing Tier Four services for young people with complex needs, there is little to suggest provision for regular substance users (such as those interviewed in the current studies) who may have problems relating to their use, but who are not drug dependent. Thus secondary prevention efforts that could play an important role in preventing individuals from making the transition into dependence and other complex needs are currently limited.

Second, better information on the severity of problems relating to drug use and the intervention needs in young drug users is required. At present we have very little knowledge of the proportion of young people who use different drugs on a regular basis and less still regarding how many of these experience problems with their use. Nor have we any indication on how patterns may vary by age, gender, ethnicity or region etc. Data from the regional drug misuse databases exists, but is only collected at admission (or re-admission) to treatment (so does not include data on long-term clients)

and tends to be biased towards heroin and injecting drug use, as treatment services readily attract this type of user. A large proportion of the sample surveyed in Study Three reported problems relating to their substance use. While the measures used provided no indication of the severity of such problems, or the extent to which users were concerned about them, the findings could be interpreted as a marker of potential need. Consequently, studies such as those described in this thesis could play a valuable role in helping to fill the knowledge gap between school surveys and research which is conducted on treatment populations. A systematic assessment is required to determine the treatment service needs for young users of all drugs and more research is needed to examine how the problems they encounter might be addressed. It is crucial that we gain a better understanding of the types of problems experienced and how these relate to patterns of use, so that effective responses can be planned. There is also a need to improve the systematic monitoring of outcomes from interventions so that future planning can realistically work towards realising the Government drug strategy targets. This work is vital to realise the aim that by 2004 there is *"early identification of need; and tailored support to all those who need it when they need it"* (p.3, UKADCU, 2001), and to ensure that well-founded decisions are made on resource allocation. The current findings indicate that assessments should not just be of use and dependence, but of patterns, problems and possibly functions, too. As previously noted, the possibility that early negative mood functions for substance use could act as a risk marker in young people should be further explored. A possible strategy could be to promote a culture in which individual Drug Action Teams (DATs) develop and monitor treatment plans for young people in their areas which are based on identified need and problem profiles in much the same way as adult services have been developed.

6.7.1 Summary

In summary, four policy implications were identified from the results described in this thesis. First, there is a need for an annual systematic national drug-use monitoring survey to be established to inform policy and treatment decisions. Second, drugs other than heroin and cocaine should be recognised and targeted in strategic guidance on drug use. Third, a systematic needs assessment to determine the treatment service needs for young users of all drugs is required on a national basis and, lastly, a system through which DATs develop and monitor treatment plans for young people in their areas and assess their effectiveness should be established. This would facilitate better service

provision for meeting the needs of young users of a range of psychoactive drug types in addition to heroin and cocaine.

6.8 Future research directions

A number of areas for further research can be identified based on the results described. These include further development of the measures used, testing findings in relation to other drugs and within other target populations, and the evaluation of the use of a functional approach in prevention and interventions. These are outlined below.

6.8.1 Development of measures

The measures developed in this thesis could be modified further in future studies. Individual items could be refined and additional items added to the function and negative effects scales. Test-retest data needs to be gathered on these scales to establish the stability of these measures over time. The predictive validity of the measures could also be examined to assess the extent to which these constructs are systematically related to future patterns of behaviour, problems or treatment outcomes. Furthermore, the relevance of these scales for measuring functions and negative effects associated with different drug types (including opiates and benzodiazepines) could also be explored. In particular, given recent reports that in certain areas of the UK there is evidence that heroin use is on the increase (Parker et al., 1998b), the utility of these measures to address functions and negative effects related to heroin use could be prioritised. There may be a core set of function measures that are relevant to all drug types, which need to be supplemented by additional measures for the specific substance under study.

6.8.2 Different target populations

In order to establish how widely the findings described in this thesis are applicable to other substance users, there is a need for further research using samples from different populations. Similar studies could be conducted that sample young people from different age groups, ethnic backgrounds or regional areas. Additionally, such studies could target users of different drug types or those who already have existing substance dependence diagnoses. The extent to which similar findings would be obtained from adult clinical and non-clinical samples could also be examined.

6.8.3 Prevention and intervention

The use of a longitudinal study design would allow further exploration of the links between functions and behaviour. In particular, links between negative mood functions and problem scores could be studied more closely to ascertain possible directional influences. This would also enable further exploration of how functions predict patterns of use, as well as the accuracy of future substance-use expectations. If such studies were to provide evidence that negative mood functions precede problems, studies could examine the impact of raising awareness of functions for use as a prevention or early intervention strategy with users before problematic use develops.

More detailed exploration of functions that underpin concurrent substance use and the potential risks associated with such behaviours is required to inform health education messages.

Research could also examine differences in predictors, outcomes and natural histories between groups of substance users who are characterised by different functional profiles. The possibility of using this kind of taxonomy to match types of user to types of treatment could also be explored.

6.9 Concluding comments

This thesis has examined influences on substance use in young polydrug users. Specifically, it aimed to assess and model patterns of substance use and associated problems in a sample of young people. The programme of research progressed via three studies. An initial study explored influences on patterns of substance using qualitative methods. The second study was a focused quantitative examination of the key influences identified in study one that tested an analytical approach to modelling patters of use and future use expectations. The third was a formal quantitative survey that modelled a number of individual and social influences on patterns of use, problems and future use expectations. In particular, the importance of recognising the role of functions for substance use in explaining patterns of consumption in a range of substances commonly used by young people in the UK has been emphasised.

Four main conclusions can be drawn from the data presented:

- *A range of environmental, social and individual influences are likely to impact on the decisions that young people make about substance use and a cost-benefit*

framework can help efforts to understand the relationship between these influences.

- *Perceived functions for the use of a range of drugs can be measured and can contribute to our understanding of patterns of consumption.*

- *Specific functions may have a positive association with the development of substance-related problems in young people.*

- *The use of peer interviewers to access and interview hidden populations of young drug users is a feasible and economical research method.*

Studying the role of functions for substance use is a promising approach to improving understanding of substance use in young people and how problems related to use may develop. This aspect of drug behaviour has been neglected in research during the past 20 years, which has tended to focus more heavily on the more distal construct of drug-related expectancies. If work on drug-use functions is to be developed further, efforts need to be refocused and a similarly rigorous approach adopted.

The final chapter of this thesis has focused on the implications of the key findings described in three areas. First, the research findings were summarised and the key questions that underpinned the studies were discussed. Implications for understanding substance use in young people were then examined. This was followed by consideration of potential practical implications of the results in terms of prevention and education interventions, and in relation to current UK drug policy. The final section suggested some future directions for research in this area that can build on the current programme of work.

If efforts to reduce substance use and the associated harms are to be realised, improved understanding of the mechanisms that underlie transitions between experimental and regular use, and the development of problematic patterns of consumption is needed. Application of this work could make a valuable contribution to the development of a systematic educational and health service response to young drug users in the U.K.

REFERENCES

Aarons, G.A., Brown, S.A., Stice, E., & Coe, M.T. (2001). Psychometric evaluation of the marijuana and stimulant effect expectancy questionnaires for adolescents. *Addictive Behaviors*, 26, 219-236.

Abbey, A., Smith, M.J., & Scott, R.O. (1993). The relationship between reasons for drinking alcohol and alcohol consumption: An interactional approach. *Addictive Behaviors*, 18, 659-670.

Adams, J., Bowman, K., Burke, B., Casson, L., Caviness, L., Coffey, L.E., Devore, J., Durham, J., Ellis, C., Hewitt, D., Hinsdale, M., Johnson, I., Myers, S., Penne, M., Zelon, J., & Virag, T. (2001). *1999 National Household Survey on Drug Abuse Data Collection, Final Report to Substance Abuse and Mental Health Services* Administration Rockville, Maryland Research Triangle Institute.

Adlaf, E.M., Paglia, A., Ivis, F.J. & Ialomiteanu, A. (2000). Non-medical drug use among adolescent students: highlights from the 1999 Ontario Student Drug Use Survey. *CMAJ*, 162(12), 1677-1680.

Adler, P.A. (1985). *Wheeling and Dealing: An ethnography of an upper-level drug dealing and smuggling community*. Columbia University Press.

Ajzen, I., & Fishbein, M. (1973). Attitudinal and normative variables as predictors of specific behaviours. *Journal of Personality and Social Psychology*, 27, 41-57.

Aldridge, J., Parker, H., & Measham, F. (1999). *Drug Trying and Drug Use Across Adolescence*, Drugs Prevention Initiative, Paper 24, Home Office, London.

Allsopp, J.F. (1986). Personality as a determinant of beer and cider consumption among young men. *Personality and Individual differences*. 7 (3), 341-347.

American Psychiatric Association (1994). *American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders* (4th ed). Washington DC.

Amsel, Z., Mandell, W., Matthias, L., Mason, C., & Hocherman, I. (1976). Reliability and validity of self-reported illegal activities and drug use collected from narcotic addicts. *International Journal of the Addictions*, 11 (2), 325-336.

Anastasi, A. (1988). *Psychological testing*. New York, NY: Macmillan.

Andrews, J.A., Hops, H., Ary, D., Tildesley, E., & Harris, J. (1993). Parental Influence on Early Adolescent Substance Use: Specific and Nonspecific Effects. *Journal of Early Adolescence.* 13 (3), 285-310.

Anthony, J.C., & Petronis, K.R. (1995). Early-onset drug use and risk of later drug problems. *Drug and Alcohol Dependence*. 40(1), 9-15.

Aquilino, W.S. (1992). Telephone versus face-to-face interviewing for household drug use surveys. *International Journal of the Addictions*. 27, 71-91.

Aquilino, W.S. (1993). Effects of spouse presence during the interview on survey responses concerning marriage. *Public Opinion Quarterly*. 57, 358-376.

Ary, D.V., Duncan, T.E., Biglan, A., Metzler, C.W., Noell, J.W., & Smolkowski, K. (1999). A development of adolescent problem behavior. *Journal of Abnormal Child Psychology*, 27(2), 141-150.

Ashton, C.H., & Kamali, F. (1995). Personality, lifestyles, alcohol and drug consumption in a sample of British Medical Students. *Medical Education*, 29, 187-192.

Avico, U., Kaplan, C., Korczak, D., & Van Meter, K. (1988). *Cocaine epidemiology in three European community cities. A pilot study using a snowball sampling methodology.* Research report of the Cocaine Steering Group (Health Directorate Commission of The European Communities Brussels, Belgium, February).

Babor, T.F., Brown, J., & Del Boca, F. (1990). Validity of self-reports in applied research across *Addictive Behaviors*: Fact or fiction? *Behavioral Assessment*, 12(1), 5-31.

Babor, TF., Stephens, R.S., & Marlatt, G.A. (1987). Verbal report methods in clinical research on alcoholism: Response bias and its minimization. *Journal of Studies on Alcohol,* 48(5), 410-424.

Bachman, J.G., O'Malley, P.M., & Johnston, L.D. (1984). Drug use among young adults: the impacts of role status and social environment. *Journal of Personality and Social Psychology,* 47, 629-645.

Bachman, J.G., Wadsworth, K.N., O'Malley, P.M., Johnston, L.D, & Schulenberg, J.E. (1997). *Smoking, Drinking and Drug Use in Young Adulthood: The impacts of New Freedoms and New Responsibilities.* Lawrence Erlbaum Associates, Mahwah, New Jersey.

Bagnall, G. (1988). Use of alcohol, tobacco and illicit drugs amongst 13-year-olds in three areas of Britain. *Drug and Alcohol Dependence*, 22, 241-251.

Bailey, S.L., & Hubbard, R.L. (1991). Developmental Changes in Peer Factors and the Influence on Marijuana Initiation Among Secondary School Students. *Journal of Youth and Adolescence*, 20 (3), 339-360.

Bailey, S.L., Flewelling, R.L., & Rachal, J.V. (1992). Predicting Continued Use of Marijuana Among Adolescents: The Relative Influence of Drug-specific and Social Context Factors. *Journal of Health and Social Behavior*, 33, 51-66.

Balding, J. (1997). *Young people in 1996.* Schools Health Education Unit, University of Exeter.

Balding, J. (1998). *Young people and illegal drugs in 1998*. Schools Health Education Unit, University of Exeter.

Balding, J. (2000). *Young people and illegal drugs into 2000*. Schools Health Education Unit, University of Exeter.

Bale, R.N., Van Stone, W.W., Engelsing, T.M.J., Zarcone, V.P., & Kuldau, J.M. (1981). The validity of self-reported heroin use. *International Journal of the Addictions*, 16 (8), 1387-1398.

Ball, J.C. (1965). Two patterns of narcotic drug addiction in the United States. *Journal of Criminal Law, Criminology and Police Science*, 56 (June), 203-211.

Ball, J.C. (1967). The reliability and validity of interview data obtained from 59 narcotic drug addicts, *American Journal of Sociology*, 72, 650-659.

Bamford, T., Child, P., DrugScope and Marsden, J., (2000). *Commissioning Tier IV services for Young People.* Confidential Report for the Department of Health, London.

Barnea, Z., Rahav, G., & Teichman, M. (1987). The reliability and consistency of self-reports on substance use in a longitudinal study. *British Journal of Addiction*, 82, 891-898.

Barnea, Z., Teichman, M., & Rahav, G. (1992). Personality, Cognitive, and Interpersonal Factors in Adolescent Substance Use: A Longitudinal Test of an Integrative Model. *Journal of Youth and Adolescence*, 21 (2), 187-201.

Barnard, M., Forsyth, A., & McKeganey, N. (1996). Levels of drug use among a sample of Scottish school children. *Drugs: Education, Prevention and Policy*, 3(1), 81-96.

Barnes, G.M., & Welte, J.W., (1986). Patterns and predictors of alcohol use among 7th-12th grade students in New York State. *Journal of Studies on Alcohol*. 47(1), 53-62.

Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator distinction in social psychological research: conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology,* 51, 1173-1182.

Battistich, V.A., & Zucker, R.A. (1980). A multivariate social-psychological approach to the prediction of psychoactive drug use in young adults. *International Journal of the Addictions,* 15 (4), 569-583.

Bauman, K.E., & Ennett, S.T. (1994). Peer influence on adolescent drug use. *American Psychologist*, 49 (9), 820-822.

Bauman, K.E., & Ennett, S.T. (1996). On the importance of peer influence for adolescent drug use: commonly neglected considerations. *Addiction*, 91, 185-198.

Beck, K.H., Thombs, D.L., Mahoney, C.A. & Fingar, K.M. (1995). Social context and sensation seeking: gender differences in college student drinking motivations. *International Journal of the Addictions*, 30(9), 1101-1115.

Becker, H.S. (1963). *Outsiders: studies in the sociology of deviance.* New York: The Free Press of Glencoe.

Beckman, L.J., & Bardsley, P.E. (1981). The Perceived Determinants and Consequences of Alcohol Consumption among Young Women Heavy Drinkers. *International Journal of the Addictions*, 16 (1), 75-88.

Bennett, M.E., Miller, J.H., & Woodall, W. G. (1999). Drinking, binge drinking and other drug use among Southwestern undergraduates: Three-year trends. *American Journal of Drug & Alcohol Abuse.* 25(2), 331-350.

Bentler, P.M., & Speckhart, G. (1979). Models of attitude-behavior relations, *Psychological Review*, 86, 452-64.

Berndt, T.J. (1979). Developmental changes in conformity to peers and parents. *Developmental Psychology*, 15, 608-616.

Best, D.W., & Barrie, A. (1997). Substance activity and attitudes among 12 to 19 year olds in Greater Easterhouse: A participative outreach study. *Journal of Substance Misuse*, 2, 197-202.

Best, D.W., Mortimer, R.M. & Davies, J.B. (1995). *Fast Forward Peer Education in Schools Evaluation Report.* Fast Forward Positives Lifestyles Ltd. Report for the Scottish Office.

Beutler, L.E., Wakefield, P., & Williams, R.E. (1994). Use of psychological tests/instruments for treatment planning. In Maruish, M.E., et al., (eds), *The use of psychological testing for treatment planning and outcome assessment.* Hillsdale, NJ, USA: Lawrence Erlbaum Associates.

Biemer, P.P., & Witt, M. (1997). Repeated Measures Estimation of Measurement Bias for Self-reported Drug Use with Applications to the National Household Survey on Drug Abuse. In Harrison, L., & Hughes, A. (eds) *The validity of self reported drug use: improving the accuracy of survey estimates. NIDA monograph 167.* US Department of Health and Human Services, NIH, Rockville, MD.

Biernacki, P. (1986). *Pathways from Heroin Addiction: Recovery Without Treatment* (Philadelphia, Temple University Press).

Biernacki, P., & Waldorf, D. (1981). Snowball sampling: problems and techniques of chain referral sampling. *Sociological Methods and Research*, 10 (2), 141-163.

Billingham, R.E., Parrillo, A.V., & Gross, W.C. (1993). Reasons Given by College Students for Drinking: A Discriminant Analysis Investigation. *International Journal of the Addictions*, 28 (8), 793-802.

Block, J., & Block, J.H. (1988). Longitudinally foretelling drug usage in adolescence; Early childhood personality and environmental precursors. *Child Development*, 59, 336-355.

Blum, R. (1987). Contemporary threats to adolescent health in the US, *JAMA*, 257: 3390-3395.

Bonito, A.J., Nurco, D.N., & Shaffer, J.W. (1976). The veridicality of addicts self-reports in social research. *International Journal of the Addictions*. 11, 719-724.

Botvin, G.J., Epstein, J.A., Baker, E., Diaz, T., & Ifill-Williams, M. (1997). School-based drug abuse prevention with inner-city minority youth. *Journal of Child and Adolescent Substance Abuse*. 6(1), 5-19.

Botvin, G.J., Baker, E., Botvin, E.M., Fillazzola, A.D., & Millman, R.B. (1984). Prevention of alcohol misuse through the development of personal and social competence: a pilot study. *Journal of Studies on Alcohol*, 45(6), 550-552.

Botvin, G.J., Baker, E., Dusenbury, L., Botvin, E.M., & Diaz, T. (1995). Long-term follow-up results of a randomised drug abuse prevention trial in a white middle-class population. *Journal of the American Medical Association*, 273, 14, 1106-1112.

Botvin, G.J., Baker, E., Filazzola, A.D., & Botvin, E.M. (1990). A cognitive-behavioural approach to substance abuse prevention: one-year follow-up. *Addictive Behaviors*, 15, 47-63.

Botvin, G.J., Dusenbury, L., Baker, E., James-Ortiz, S., Botvin, E.M., & Kerner, J. (1992). Smoking Prevention Among Urban Minority Youth: Assessing Effects on Outcome and Mediating Variables. *Health Psychology*, 11(5) 290-299.

Boys, A., Marsden, J., Griffiths, P., Fountain, J., Stillwell, G., & Strang, J. (1999a) Substance use among young people: the relationship between perceived functions and behavioural intentions. *Addiction*, 94(7), 1043-1050.

Boys, A., Marsden, J., Fountain, J., Griffiths, P., Stillwell, G., & Strang, J. (1999b) What influences young people's use of drugs? A qualitative study of decision-making. *Drugs Education, Prevention and Policy*, 6(3), 373-389.

Boys, A., Marsden, J., & Griffiths, P. (1999c) Reading between the lines: is cocaine becoming the stimulant of choice for urban youth? *Druglink*, 14(1), 20-23.

Boys, A., Fountain, J., Marsden, J., Griffiths, P., Stillwell, G., & Strang, J. (2000a). *Drug Decisions: a qualitative study of young people, drugs and alcohol.* London: Health Education Authority.

Boys, A., Marsden, J., Griffiths, P., & Strang, J., (2000b). Drug use functions predict cocaine-related problems. *Drug and Alcohol Review*, 19, 181-190.

Boys, A., Dobson, J., Marsden, J., & Strang, J. (2000c). *Cocaine Trends: a qualitative study of young cocaine users*. Report to Action-on-Addiction, National Addiction Centre, London.

Bradizza, C.M., Reifman, A., & Barnes, G.M. (1997). Social and Coping Reasons for Drinking: Predicting Alcohol Misuse in Adolescents. *Journal of Studies on Alcohol*, 60, 491-499.

Bradley, J.R., Carman, R.S., & Petree, A. (1992). Personal and social drinking motives, family drinking history and problems associated with drinking in two university samples. *Journal of Drug Education*, 22, 195-202.

Brain, K., Parker, H., & Bottomley, T. (2001). Untreatable? Hidden Crack Cocaine and Poly Drug Users. In Parker, H., Aldridge, J., & Egginton, R. (eds). *UK Drugs Unlimited: new research and policy lessons on illicit drug use.* Palgrave, Hampshire.

Braucht, G.N. (1980). Psychosocial research on teenage drinking: Past and future. In Scarpetti, F.R., & Batesman, S.K. (eds). *Drugs and Youth Culture*, Beverly Hills, CA, Sage.

Breeze, J., Aldridge, J., & Parker, H. (2001).Unpreventable? How Young People Make and Remake Drug Taking Decisions. In Parker, H., Aldridge, J., & Egginton, R. (eds). *UK Drugs Unlimited: new research and policy lessons on illicit drug use.* Palgrave, Hampshire.

Brenner, M. (1985). Survey Interviewing. In Brenner, M., Brown, J., & Canter, D. (eds). *The Research Interview.* Academic Press, London.

Breslau, N., Fenn, N., & Peterson, E.L. (1993). Early smoking initiation and nicotine dependence in a cohort of young adults. *Drug and Alcohol Dependence*, 33(2), 129-137.

Brook, J.S., Whiteman, M., Gordon, A.S., & Brook, D.W. (1990). The role of older brothers in younger brothers' drug use viewed in the context of parent and peer influences. *The Journal of Genetic Psychology*, 151 (1), 59-75.

Brown, B.B. (1989). The role of peer groups in adolescents' adjustment to secondary school. In Berndt, T.J., & Ladd, G.W. (eds), *Peer Relationships in Child Development.* John Wiley & Sons, New York.

Brown, B.B., Eicher, S.A., & Petrie, S. (1986). The importance of peer group ("crowd") affiliation in adolescence. *Journal of Adolescence*, 9, 73-96.

Brown, S.A. (1985). Expectancies versus background in the prediction of college drinking patterns, *Journal of Consulting and Clinical Psychology*, 53, 123-130.

Brown, R. (1986). *Social Psychology: the second edition.* Macmillan, New York.

Brown, S.A., Goldman, M.S., Inn, A., & Anderson, L.R. (1980). Expectations of reinforcement from alcohol: their domain and relation to drinking patterns. *Journal of Consulting and Clinical Psychology*, 43, 419-426.

Brown, S.A., Myers, M.G., Mott, M.A., & Vik, P.W. (1994). Correlates of success following treatment for adolescent substance abuse. *Applied & Preventive Psychology*. 3(2), 61-73.

Brown, S.A., Myers, M.G., Lippke, L.F., Stewart, D.G., Tapert S.G., & Vik, P.W. (1998). Psychometric evaluation of the Customary Drinking and Drub Use Record (CDDR): a measure of adolescent alcohol and drug involvement. *Journal of Studies on Alcohol*, 59, 427-438.

Brown, J., & Kreft, I. (1998). Zero effects of drug prevention programmes. *Evaluation Review*, 22, 3-4.

Bry, B., McKeon, P., & Pandina, R. (1982). Extent of drug use as a function of number of risk factors. *Journal of Abnormal Psychology*, 91 (4), 273-279.

Buchanan, D.R. (1991). How teens think about drugs: insights from moral reasoning and social bonding theory. *International Quarterly of Community Health Education*.11 (4), 315-332.

Buchanan, D.R. (1993). Social status group differences in motivations for drug use. *The Journal of Dug Issues*, 23 (4), 631-644.

Buckhalt, J.A., Halpin, G., Noel, R., & Meadows, M.E. (1992). Relationship of drug use to involvement in school, home and community activities: results of a large survey of adolescents. *Psychological Reports*, 70, 139-146.

Bureau of Justice Assistance, U.S. Department of Justice, (1988). *Implementing Project DARE: Drug Abuse Resistance Education*. Washington, DC: Bureau of Justice Assistance.

Bush, P. J., Zuckerman, A.E., Theiss, P.K., Taggart, V.S., Horowitz, C., Sheridan, M.J., & Walter, H.J. (1989). Cardiovascular risk factor prevention in Black Schoolchildren: two-year results of the "Know Your Body" program. *American Journal of Epidemiology*, 129, 466-482.

Butler, M.C., Gunderson, E.K.E. & Bruni, J.R. (1981). Motivational determinants of illicit drug use: An assessment of underlying dimensions and their relationship to behaviour. *International Journal of the Addictions*, 16, 243-252.

Cahalan, D., Cisin, I.H., & Crossley, H.M. (1969). *American Drinking Practices: A National Study of Drinking Behavior and Attitudes*. New Brunswick, New Jersey

Campo, A.T., & Rohner, R.P. (1992). Relationships between perceived parental acceptance-rejection, psychological adjustment, and substance abuse among young people. *Child Abuse & Neglect*, 16, 429-440.

Carey, K.B. (1995). Alcohol-Related Expectancies Predict Quantity and Frequency of Heavy Drinking Among College Students. Psychology of *Addictive Behaviors*, 9(4), 236-241.

Carey, K.B. (1997). Reliability and validity of the time-line follow-back interview among psychiatric outpatients: A preliminary report. Psychology of *Addictive Behaviors*. 11 (1), march 1997, 26-33.

Carey, K.B., & Correia, C.J. (1997). Drinking Motives Predict Alcohol-Related Problems in College Students. *Journal of Studies on Alcohol*, 58, 100-105.

Carman, R.S. (1979). Motivations for drug use and problematic outcomes among rural junior high school students. *Addictive Behaviors*, 4, 91-93.

Carman, R.S., & Holmgren, C. (1986). Gender differences in the relationship of drinking motivations and outcomes. *The Journal of Psychology*, 120 (4), 375-378.

Carman, R.S., Fitzgerald, B.J., & Holmgren, C. (1983). Drinking Motivations and Alcohol Consumption Among Adolescent Females. *The Journal of Psychology*, 114, 79-82.

Catalano, R.F., Kosterman, R., Hawkins, J.D., Newcomb, M.D., & Abbott, R.D. (1996). Modelling the etiology of adolescent substance use: a test of social development model. *Journal of Drug Issues*, 26 (2), 429-455.

Cato, B.M. (1992). Youth's recreation and drug sensations: is there a relationship? *Journal of Drug Education*, 22, 293-301.

Cavanaugh, S.V., Clark, D.C., & Gibbons, R.D. (1983). Diagnosing depression in the hospitalised medically ill. *Psychosomatics*. 24(9), 809-815.

Christiansen, B.A., Goldman M.S., & Inn A. (1982). Development of alcohol-related expectancies in adolescents: separating pharmacological from social-learning influences. *Journal of Consulting and Clinical Psychology*. 50(3), 336-44.

Christiansen, B.A., & Goldman, M.S. (1983). Alcohol-related expectances versus demographic/background variables in the predication of adolescent drinking. *Journal of Consulting and Clinical Psychology*, 51, 249-257.

Clapp, J. D., Shillington, A.M., Segars, L.B. (2000). Deconstructing contexts of binge drinking among college students. *American Journal of Drug & Alcohol Abuse*. 26(1), 139-154.

Claussen, B. (1999). Alcohol disorders and re-employment in a 5-year follow-up of long-term unemployed. *Addiction*. 94(1), 133-138.

Clayton, R.R., & Ritter, C. (1985). The epidemiology of alcohol and drug abuse among adolescents. *Advances in Alcohol and Substance Abuse*, 4, 69-97.

Clayton, R.R.,(1992). Transitions in drug use: risk and protective factors. In Glantz, M.D. & Pickens, R.W. (eds). *Vulnerability to Drug Abuse*. Washington DC: American Psychological Association.

Cloninger, C.R., Bohman, M. & Sigvardsson, S. (1981). Inheritance of alcohol abuse: Cross-fostering analysis of adopted men. *Archives of General Psychiatry*. 38(8), 861-868.

Cohen, J., & Cohen, P. (1983). *Applied Multiple Regression/Correlation Analysis for the Behavioural Sciences* (2nd edition). Lawrence Erlbaum Associates, London.

Collins English Diction: 21st Century edition (2000), 5th edition.

Commonwealth Department of Health (1999). *National Drug Strategic Framework 1998-99 to 2002-03*. Canberra.

Conner, M. & Sparks, P. (1997). The Theory of Planned Behaviour and Health Behaviours. In Conner, M., & Norman, P. (eds) *Predicting Health Behaviour*. Open University Press, Buckingham.

Conner, M., & Norman, P. (1995). The role of social cognition in health behaviours. In Conner, M., & Norman, P. (eds) *Predicting Health Behaviour*. Open University Press, Buckingham.

Connors, G.J., O'Farrell, T.J., & Cutter, H.S.G. (1990). Using a drinking motivation scale to predict degrees of problematic drinking. *Drug and Alcohol Dependence*, 26, 175-181.

Cooper, M.L., Russell, M., & George, W.H. (1988). Coping, expectancies, and alcohol abuse: a test of social learning formulations. *Journal of Abnormal Psychology*, 97, 218-230.

Cooper, M.L. (1994). Motivations for alcohol use among adolescents: Developmental and validation of a four factor model. *Psychological Assessment*, 6, 117-128.

Cooper, M.L., Frone, M.R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: a motivational model of alcohol use. *Journal of Personality and Social Psychology*, 69, 990-1005.

Cooper, M.L., Russell, M., Skinner, J.B., & Windle, M. (1992). Development and validation of a three-dimensional measure of drinking motives. *Psychological Assessment*, 4, 123-132.

Corkery, J.M. (2000). *Drug seizure and offender statistics, United Kingdom, 1998*. Home Office Statistical Bulletin Issue 3/00. London: Government Statistical Service.

Corkery, J.M. (1998). Statistics of Drugs seizures and offenders dealt with, United Kingdom, 1996. Home Office Statistical Bulletin Issue 10/98. London: Government Statistical Service.

Cox, W.M, & Klinger, E. (1988). A Motivational Model of Alcohol Use. *Journal of Abnormal Psychology*, 97(2), 160-180.

Critchlow, B. (1987). A Utility Analysis of Drinking (Brief Report). *Addictive Behaviors*, 12, 269-273.

Crockett, L.J. and Peterson, A, C. (1993). Adolescent development: health risks and opportunities for health promotion. In: Millstein,, S.G Petersen, A.C. & Nightingale, E.O. (Eds). *Promoting the health of adolescents: new directions for the twenty-first century.* Oxford University Press, New York p.13-37.

Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-334.

Cronin, C. (1997). Reasons for Drinking Versus Outcome Expectancies in the Prediction of College Student Drinking. *Substance Use & Misuse*, 32(10), 1287-1311.

Dale, A., & Marsh, C. (eds) (1993). *The 1991 Census Users' Guide*, London: HMSO.

Darke, S.., Hall, W., Wodak, A., Heather, N., & Ward, J. (1992). Development and validation of a multi-dimensional instrument for assessing outcome of treatment among opiate users: the Opiate Treatment Index. *British Journal of Addiction*, 87, 733-742.

Davies, M., & Kandel, D.B. (1981). Parental and peer influences on adolescents' educational plans: some further evidence. *American Journal of Sociology*, 87, 363-387.

Davies, J. B., & Baker, R. (1987). The impact of self-presentation and interviewer bias effects on self-reported heroin use. *British Journal of Addiction*, 82, 907-912.

Davies, J.B. (1992). *The Myth of Addiction: Attributional Perspectives on the Nature of Addiction.* Harwood Academic, Reading.

Davies, J. B., & Best, D.W. (1995). Demand characteristics and research into drug use. *Psychology and Health* , 11, 291-299.

Davies, J. B. (1996). Reasons and Causes: Understanding Substance Users' Explanations for their behaviour. *Human Psychopharmacology*, 11. S39-S48.

Davis, K.E. (1972). Drug effects and drug use. In Wrightsman, L.S. (ed). *Social psychology in the seventies.* Monterey, California: Brooks-Cole, 517-545.

Davis, G., & Dawson, N. (1995). *Using Diversion To Communicate Drugs Prevention Messages To Young People.* Home Office Drugs Prevention Initiative paper 12, The Stationary Office, London.

Davison, D. (1980). *Actions, Reasons, Causes: Essays on Actions and Events.* Oxford University Press.

Departments of Health and Social Security Library Services (DH/DSS), (1993). *DH/DSS-Data thesaurus*. London: DHSS library services. CHECK REF

DeWit, D.J., Offord, D.R., & Wong, M. (1997). Patterns of onset and cessation of drug use over the early part of the life course. *Health Education and Behaviour*, 24 (6), 746-58.

DfEE, (1995). *Circular number 4/95: Drug Prevention and Schools*, Departments for Education and Employment.

Diaz, A., Barruti, M., and Doncel, C. (1992). *The Lines of Success? A study on the Nature and Extent of Cocaine Use in Barcelona,* Barcelona: Laboratori de Sociologica.

Dinges, M.M., & Oetting, E.R. (1993). Similarity in drug use patterns between adolescents and their friends. *Adolescence*, 28 (110), Summer, 253-266.

Dishion, T.J., Capaldi, D.M., & Yoerger, K. (1999). Middle Childhood Antecedents to Progressions in Male Adolescent Substance Use: An Ecological Analysis of Risk and Protection. *Journal of Adolescent Research*, 14 (2), 175-205.

Dishion, T.J., Capaldi, D.M., Spracklen, K.M. & Li, F. (1995). Peer ecology of male adolescent drug use. *Development and Psychopathology*, 7, 803-824.

Dohner, V.A. (1972). Motives for Drug Use: Adult and Adolescent. Reprinted from *Psychosomatics*, 13, 317-324.

Donovan, D.M., Jessor, R & Jessor, L. (1983). Problem drinking in adolescence and young adulthood: a follow-up study. *Journal of Studies on Alcohol*, 44, 109-137.

Donovan, D.M., Marlatt, G.A., & Salzberg, P.M. (1983). Drinking behavior, personality factors and high-risk driving: a review and theoretical formulation. *Journal of Studies on Alcohol*, 44, 395-428.

Donovan, J.E., Jessor, R., & Costa, F.M. (1988). Syndrome of problem behavior in adolescence: a replication. *Journal of Consulting and Clinical Psychology*, 56 (5), 762-766.

Dorn, N., & Murji, K. (1992). *Drug Prevention: a review of the English language literature.* Research Monograph 5, ISDD, London.

DrugScope, (2000). *UK Drug Situation 2000: The UK report to the European Monitoring Centre for Drugs and Drug Addiction* (EMCDDA). London: DrugScope.

Dryfoos, J. (1990). *Adolescents at risk: prevalence and prevention.* Oxford University Press, N.Y.

Duffy, F.C. & Waterton, J.J. (1984). Under-reporting of alcohol consumption in sample surveys: the effect of computer interviewing in fieldwork. *British Journal of Addiction*, 79(3), 303-308.

Dukes, R. L., Ullman, J. B., & Stein, J. A. (1996). A three-year follow-up of Drug Abuse Resistance Education (D.A.R.E.). *Evaluation Review*, 20, 49–66.

Duncan, S.C., Duncan, T.E., Biglan, A. & Ary, D. (1998). Contributions of the social context to the development of adolescent substance use: a multivariate latent growth modelling approach. *Drug and Alcohol Dependence*, 50, 57-71.

Dunne, F.J., Galatopoulos, C., & Schipperheijn, J.M. (1993). Gender Differences in Psychiatric Morbidity Among Alcohol Misusers. *Comprehensive Psychiatry*, 34 (2), 95-101.

Dunst, C.J., & Trivette, C.M. (1994). Methodological considerations and strategies for studying the long-term follow-up of early intervention. In Friedman, S., & Haywood, J.C., (eds). *Developmental Follow-up: Concepts, Domains and Methods*. San Diego, CA: Academic Press, 277-313.

Eagly, A. H. (1983). Gender and Social Influence. *American Psychologist*, 38, 971-981.

Earleywine, M. & Newcomb, M.D. (1997). Concurrent versus simultaneous polydrug use: prevalence, correlates, discriminant validity and prospective effects on health outcomes. *Experimental and Clinical Psychopharmacology*, 5 (4), 353-364.

Edwards, G., Hensmann, C., & Peto, J. (1973). A comparison of female and male motivation for drinking. *International Journal of the Addictions*, 8 (4), 577-587.

Edwards, W. (1954). The theory of decision making. *Psychological Bulletin*, 51, 380-417.

Egginton, R., Aldridge, J., & Parker, H. (2001). Unconventional? Adolescent Drug Triers and Users in England. In Parker, H., Aldridge, J., & Egginton, R. (eds). *UK Drugs Unlimited: new research and policy lessons on illicit drug use*. Palgrave, Hampshire.

Ellickson, P.L., & Bell, R.M., (1990). Drug prevention in junior high: A multi-site longitudinal test. *Science*, 247(4948), 1299-1305.

Elliott, D.S., Huizinga, D. & Menard, S. (1989). *Multiple Problem Youth: Delinquency, Substance use and Mental Health Problems*. New York: Springer-Verlag.

Ensminger, M.E., Brown, C.H., & Kellam, S.G. (1984). *Social control as an explanation of sex differences in substance use among adolescents*. National Institute on Drug Abuse: Research Monograph Series. Mono 49, Mar 1984, 296-304.

Epstein, J.A., Botvin, G., Diaz, T., & Schinke, S.P. (1995). The Role of Social Factors and Individual Characteristics in Promoting Alchol Use among Inner-City minority Youths. *Journal of Studies on Alcohol*, 56, 39-46.

Epstein, J.A., Botvin, G.J., Diaz, T., Toth, V. & Schinke, S. P. (1995). Social and personal factors in marijuana use and Intention to use drugs among inner city minority youth. *Developmental and Behavioural Paediatrics*, 1, 14-20.

Erickson, P., Adlaf, E. M., Murray, G.F. and Smart, R.G. (1987). *The Steel Drug: Cocaine in perspective,* Toronto, Lexington Books.

ESPAD, (1997). *Alcohol and Other Drug Use Among Students in 26 European Countries,* Swedish Council on Alcohol and Other Drugs, Stockholm.

European Monitoring Centre For Drugs and Drug Addiction, (1997). *Annual Report on the State of the Drugs Problem in the European Union.* Lisbon: EMCDDA.

European Monitoring Centre For Drugs and Drug Addiction, (2000). *Annual Report on the State of the Drugs Problem in the European Union.* Lisbon: EMCDDA.

Farber, P.D., Khavari, K. A., & Douglass, F.M. (1980). A factor analytic study of reasons for drinking: Empirical validation of positive and negative reinforcement dimensions. *Journal of Consulting & Clinical Psychology.* 48(6), 780-781.

Farrell, A.D., & Danish, S.J. (1993). Peer drug associations and emotional restraint: causes or consequences of adolescents' drug use? *Journal of Consulting and Clinical Psychology*, 61, 327-334.

Fergusson, D.M., Lynskey, M.T., & Horwood, L.J. (1994). Childhood exposure to alcohol and adolescent drinking patterns. *Addiction*, 89, 1007-1016.

Fergusson, D.M., Horwood, L.J. & Lynskey, M.T. (1995). The prevalence and risk factors associated with abusive or hazardous alcohol consumption in 16-year-olds. *Addiction*, 90, 935-946.

Fergusson, D.M., Lynskey, M.T., & Horwood, L.J. (1997). The short term consequences of early cannabis use. *Journal of Abnormal Child Psychology*, 24, 499-512.

Fergusson, D.M., & Horwood, L.J. (1997). Early onset cannabis use and psychosocial adjustment in young adults. *Addiction*, 92 (3), 279-296.

Fielding, N.G. (1981). *The National Front.* Routledge and Kegan Paul.

Fisher, LA., & Bauman, K.E. (1988). Influence and selection in the friend-adolescent relationship: findings from studies of adolescent smoking and drinking. *Journal of Applied Social Psychology*, 18, 289-314.

Fleming, J.P., Kellam, S.G., Brown, C.H., (1982). Early predictors of age at first use of alcohol, marijuana, and cigarettes. *Drug and Alcohol Dependence.* 9(4), 285-303.

Fonagy, P., Steele, M., Steele, H., Higgit, A., & Target, M. (1994). The Emmanuel Miller Memorial Lecture: The theory and practice of resilience. *Journal of Child Psychology and Psychiatry*, 35, 231-257.

Forsyth, A. J. M. (1996). Places and patterns of drug use in the Scottish dance scene. *Addiction*, 91(4), 511-521.

Fountain, J. (1992). *The Social and Economic Organisation of Cannabis Dealers.* PhD Thesis.

Fountain, J., & Howes, S. (2001) *Rough sleeping, substance use and service provision in London.* Final report. National Addition Centre, London.

Fountain, J., Bartlett, H., Griffiths, P., Gossop, M., Boys, A., & Strang, J. (1999). Why say no? Reasons given by young people for not using drugs. *Addiction Research*, 7 (4), 339-353.

Fountain J, Griffiths P, Farrell M, Gossop M, & Strang J (1998). Diversion tactics: how a sample of drug misusers in treatment obtained surplus drugs to sell on the illicit market. *International Journal of Drug Policy*, 9 (3), 159-167.

Fountain, J., Griffiths, P., Farrell, M., Gossop, M., & Strang, J. (1999). Benzodiazepines in polydrug-using repertoires: the impact of the decreased availability of temazepam gel-filled capsules. *Drugs: Education, Prevention and Policy*, 6 (1), 61-69.

Foxcroft, D.R., & Lowe, G. (1993). Self-attributions for alcohol use in older teenagers. *Addiction Research*, 1, 1-9.

Frisch, D., & Clemen, R.T. (1994). Beyond Expected Utility: Rethinking Behavioral Decision Research. *Psychological Bulletin*, 116 (1), 46-54.

Fromme, K., Stroot, E., & Kaplan, D. (1993). Comprehensive effects of alcohol: developmental and psychometric assessment of a new expectancy questionnaire. *Psychological Assessment*, 5, 36-47.

Gersick, K.E., Grady, K., Sexton, E., et al., (1981). Personality and sociodemographic factors in adolescent drug use. In Lettieri, D.J. & Ludford, J.P. (eds) *Drug Abuse and the American Adolescent*. NIDA Research Monograph 38. Washington, DC.

Gfroerer, J. C. & Hughes, A.L. (1991). The feasibility of collecting drug abuse data by telephone. *Public Health Rep* 106, 384-393.

Gfroerer, J. (1985). Influence of privacy of self-reported drug use by youths. In: B.A. Rouse et al. (eds). *Self-report methods of estimating drug use: meeting current challenges to validity.* NIDA Research Monograph 57, 22-30.

Glantz, M.D., & Pickens, R. (1992). *Vulnerability to drug abuse.* Washington, DC: American Psychological Association.

Glaser, B., & Strauss, A.L. (1967). *The discovery of grounded theory: strategies for qualitative research.* Chicago: Aldine.

Glaser, D. (1974) Interlocking dualities in drug use, drug control and crime. In Inciardi, J. A. & Chambers, C.D. (eds)., *Drugs and the criminal justice system*. p. 39-56. Beverly Hills: Sage publications, inc.

Glassner, B., & Loughlin, J. (1987). *Drugs in Adolescent Worlds: Burnouts to Straights.* Macmillan, London.

Glynn, R.J., Locastr, J.S., Hermos, J.A., & Bosse, R. (1983). Social contexts and motives for drinking in men. *Journal of Studies on Alcohol*, 44, 1011-1025.

Goddard, E., & Higgins, V. (1999). *Smoking, drinking and drug use among young teenagers in 1998 Volume I: England.* London: The Stationary Office.

Godin, G., Valois, P. Lepage, L. & Desharnais, R. (1992). Predictors of smoking behaviour: an application of Ajzen's theory of planned behaviour. *British Journal of Addiction*, 87, 1335-1343.

Godin, G., Valois, P. & Lepage, L. (1993). The pattern of influence of perceived behavioral control upon exercise behavior: an application of Ajzen's theory of planned behavior, *Journal of Behavioral Medicine*, 16, 81-102.

Goldman, MS., Brown, S.A., Christiansen, B.A., & Smith, G.T. (1987). Expectancy theory: Thinking about drinking. In H.T. Blane & K.E Leonard (eds). *Psychological theories of drinking and alcoholism*. (p.181-226). New York, Guilford Press.

Goldman, MS., Brown, S.A., Christiansen, B.A., & Smith, G.T. (1991). Alcoholism etiology and memory: broadening the scope of alcohol expectancy research. *Psychological Bulletin*, 110, 137-146.

Goodwin, D.W. (1985). Alcoholism and genetics: The sins of the fathers. *Archives of General Psychiatry*. 42(2), 171-174.

Goodwin, L. (1990). Social Psychological Bases for College Alcohol Consumption. *Journal of Alcohol and Drug Education*, 3, 83-95.

Gorsuch, R.L., & Butler, M.C. (1976). Initial drug abuse: a review of predisposing social psychological factors. *Psychological Bulletin*, 83, 120-137.

Gossop, M., Powis, B., Griffiths, P., & Strang, J. (1994). Multiple risks for HIV and hepatitis B infection among heroin users. *Drug and Alcohol Review*, 13, 293-300.

Gossop, M., Marsden, J., Stewart, D., Edwards, C., Lehmann, P., Wilson, A., Segar, G. (1997). The National Treatment Outcome Research Study in the United Kingdom: Six-month follow-up outcomes. Psychology of *Addictive Behaviors*, 11(4), 324-337.

Gossop, M., Marsden, J., Stewart, D., Lehmann, P., Edwards, C., Wilson, A., Segar, G. (1998). Substance use, health and social problems of service users at 54 drug treatment agencies: Intake data from the National Treatment Outcome Research Study. *British Journal of Psychiatry*, 173, 166-171.

Gottfredson, D.C. (1988). An evaluation of an organization development approach to reducing school disorder. *Evaluation Review*, 11, 739-763.

Graham, K., Clarke, D., Bois, C., Carver, V., Dolinki, L., Smythe, C., Harrison, S., Marshman, J., & Brett, P. (1996). Addictive Behavior of Older Adults. *Addictive Behaviors*, 21 (3), 331-348.

Grant, B., & Hartford, T. (1990). Concurrent and simultaneous use of alcohol with sedatives and tranquillizers: Results of a national survey. *Journal of Substance Abuse*, 2, 1-14.

Green, G., Macintyre, S., West, P., Ecob, R. (1991). Like parent like child? Associations between drinking and smoking behaviour of parents and their children. *British Journal of Addiction*. 86(6), 745-758.

Griffiths, P. (1998). *Qat use in London: a study of qat use among a sample of Somalis living in London.* Home Office Drugs Prevention Initiative paper 26, The Stationary Office, London.

Griffiths, P., Gossop, M., Powis, B., & Strang, J. (1993). Reaching hidden populations of drug users by privileged access interviewers: methodological and practical issues. *Addiction*, 88, 1617-1626.

Griffiths, P., Vingoe, L., & Gilman, M. (200). New Drug Trends Country Profiles. *http://www.qed.org.uk/workgroups/trendscountriesuk.html.*

Gustafson, R. (1991). Alcohol and outcome expectancies: Tolerance for socially nonacceptable behaviors. *Psychological Reports*, 69(1), 67-74.

Haden, T.L. & Edmundson, E.W. (1991). Personal and social motivations as predictors of substance use among college students. *Journal of Drug Education*, 21, 303-312.

Hall, W., Solowij, N., & Lemon, J. (1994). *The Health and Psychological Consequences of Cannabis Use*. Canberra, Australian Government Publishing Service.

Hammer, T. (1992). Unemployment and use of drug and alcohol among young people: a longitudinal study in the general population. *British Journal of Addiction*, 87, 1571-1581.

Hammer, T., & Pape, H. (1997). Alcohol-related problems in young people: how are such problems linked to gender, drinking levels and cannabis use? *Journal of Drug Issues*, 27 (4), 713-731.

Hammer, T., & Vaglum, P. (1990). Use of alcohol and drugs in the transitional phase from adolescence to young adulthood. *Journal of Adolescence*, 13, 129-142.

Hansen, W.B., Johnson, C.A., Flay, B.R., Graham, J.W., Sobel, J. (1988). Affective and Social influences approaches to the prevention of multiple substance abuse among seventh grade students: results from project SMART. *Preventive Medicine*, 17, 135-154.

Harrison, L. (1997). The validity of self-reported drug use in survey research: an overview and critique of research methods. In Harrison, L., & Hughes, A. (eds) *The validity of self reported drug use: improving the accuracy of survey estimates.* NIDA monograph 167. US Department of Health and Human Services, NIH, Rockville, MD.

Hart, L., & Hunt, N. (1997). *Choosers not losers? 'Drug offers', peer influences and drug decisions amongst 11-16 year olds in West Kent.* Invicta Community Care NHS Trust, Maidstone, Kent.

Hartnoll, R., Griffiths, P., Taylor, C., Hendricks, V., Blanken, P., Nolimal, D., Weber, I., Toussirt, M., & Ingold, R. (1997). *Handbook on snowball sampling. Pompidou Group: Group of Epidemiology Experts in Drug Problems*, Council of Europe.

Health Advisory Service (1996). *Children and young people: Substance Misuse Services: The Substance of Young needs.* Commissioning and providing services for children and young people who use and misuse substances: a manual of guidance for commissioners, purchasers and providers. London: HMSO,

Hawkins, J.D., Jenson, J.M., Catalano, R.F., & Lishner, D.M. (1988). Delinquency and drug abuse: Implications for social services. *Social Service Review*, 62, 258-284.

Hawkins, J.D., Arthur, M.W., & Catalano, R.F. (1995). Preventing substance abuse. In Tonry, M., & Farrington, D. (eds). *Crime and Justice: a review of research, volume 19. Building a safer society: strategic approaches to crime prevention.* Chicago: University of Chicago Press.

Hawkins, J.D., Catalano, R.F., & Miller, J.Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychological Bulletin*, 112, 64-105.

Hays, R.D., & Huba, G.J. (1988). Reliability and validity of drug use items differing in the nature of their response options. *Journal of Consulting and Clinical Psychology*, 56, 470-472.

Healey, A., Knapp, M., Astin, J., Gossop, M., Marsden, J., Stewart, D., Lehmann, P., & Godfrey, C., (1998). Economic burden of drug dependency: social costs incurred by drug users at intake to the National Treatment Outcome Research Study. *British Journal of Psychiatry*, 173, 160-165.

Health Education Authority/BMRB International, (1997). *Drug Use in England: Results of the 1995 National Drugs Campaign Survey.* London: Health Education Authority.

Health Education Authority/ MORI, (1992). *Tomorrow's Young Adults.* London: Health Education Authority.

Heider, F. (1958). *The Psychology of Interpersonal Relations.* Wiley: New York.

Henderson, S. (1993). Fun, Fashion and Frisson. *The International Journal of Drug Policy*, 4(3),122-129.

Henderson, M.J., Galen, L.W., & DeLuca, J.W. (1998). Temperament Style and Substance Abuse Characteristics. *Substance Abuse*, 19 (2), 61-70.

Hennekens, C.H., & Buring, J.E. (1987). *Epidemiology in medicine.* Little Brown and Company, Boston/Toronto.

Hersh, D., Mulgrew, C. L., Van Kirk, J., & Kranzler, H. R. (1999). The validity of self-reported use in two groups of cocaine abusers. *Journal of Consulting and Clinical Psychology*, 67, 37-42.

Hilton, D. & Slugoski, B. (1986). knowledge-based causal attribution: The abnormal conditions focus model. *Psychological Review*, 93, 75 - 88.

HIT (1996). *Chill Out: a clubber's guide – the second coming*. HIT, Liverpool.

Holmes, D.S. (1968). Dimensions of projection. *Psychological Bulletin*, 69, 248-268.

Honigmann, J. (1982). Sampling in ethnographic fieldwork, in Burgess, R. (Ed). *Field Research: A Sourcebook an Field Manual,* p.79-90, London, Unwin.

Hough, M. (1996). *Drugs Misuse and the Criminal Justice System: A Review of the Literature*. Home Office, Drugs Prevention Initiative.

Hoyt, G.M., & Chaloupka, F.J. (1994). Effect of Survey conditions on self-reported substance use. *Contemporary Economic Policy*. 12, 109-121.

Hser, Y.I. (1997). Self-Reported Drug Use: Results of Selected Empirical Investigations of Validity. In Harrison, L., & Hughes, A. (eds) *The validity of self reported drug use: improving the accuracy of survey estimates*. NIDA monograph 167. US Department of Health and Human Services, NIH, Rockville, MD.

Huba, G.J., Newcomb, M.D. & Bentler, P.M. (1986). Adverse drug experiences and drug Use behaviors: A one-year longitudinal study of adolescents. Journal of Paediatric Psychology, 11, 203-219.

Huba, G.J., Wingard, J.A. & Bentler, P.M. (1979). Beginning adolescent drug use and peer and adult interaction patterns. *Journal of Consulting and Clinical Psychology*, 47, 265-276.

Hubbard, R. L., Marsden, M. E, Rachal, J. V., Harwood, H. J.,Cavanaugh, E. R., & Ginzburg, H. M. (1989). *Drug Abuse Treatment: A National Study of Effectiveness*. University of North Carolina Press: Chapel Hill.

Institute for the Study of Drug Dependence, (1996). *Drug Abuse Briefing: a guide to the effects of drugs and to the social and legal facts about their non-medical use in Britain.* 6th edition, ISDD, London.

Jackson, C. (1997). Initial and experimental stages of tobacco and alcohol use during late childhood: Relation to peer, parent, and personal risk factors. *Addictive Behaviors*: An International Journal, 22(5), 685-698.

Jaffe, A.J., & Kilbey, M.M. (1994). The Cocaine Expectancy Questionnaire (CEQ): Construction and Predictive Utility. *Psychological Assessment*, 6(1), 18-26.

Jaffe, L.T., & Archer, R.P. (1987). The prediction of drug use among college students from MMPI, MCMI, and sensation seeking scales. *Journal of Personality Assessment*, 51 (2), 243-253.

Janis, I.L. & Mann, L. (1977). *Decision Making: a psychological analysis of conflict, choice and commitment.* New York: Free Press.

Jasso, N.K., & Wolkon, G.H. (1978). Drug use, attitudes and behaviors of youth in an urban free clinic. *International Journal of the Addictions*, 13(2), 317-326.

Jensen, G.F & Brownfield, D. (1983). Parents and drugs: Specifying the consequences of attachment. *Criminology: An Interdisciplinary Journal*. 21(4), 543-554.

Jessor, R., Graves, T.D., Hanson, R.C. (1968). *Teenage drinking: a survey of action programs*. Seattle, W.A; Unigard insurance group.

Jessor, R. & Jessor, S.L. (1973). A social psychology of marijuana use: Longitudinal studies of high school and college youth. *Journal of Personality & Social Psychology*. 26(1), 1-15.

Jessor, R. & Jessor, S.L. (1977). *Problem Behavior and Psychosocial Development: A Longitudinal Study of Youth*. San Diego, CA: Academic Press.

Jessor, R., & Jessor, S. L. (1978). theory testing in longitudinal research on marijuana use, in: Kandel, D.B. (Ed). *Longitudinal Research on Drug Use: Empirical findings and methodological issues,* p. 41-71 (Washington, D.C., Hemisphere-Wiley).

Jessor, R., Chase, J.A., & Donovan, J.E. (1980). Psychosocial correlates of marijuana use and problem drinking in a national sample of adolescents. *American Journal of Public Health*, 70, 604-610.

Jessor, R., Donovan, J.E., & Costa, F. (1986). Psychosocial correlates of marijuana use in adolescence and young adulthood: The past as prologue, International Symposium on Marijuana, Cocaine and Traffic Safety (1986, Santa Monica, California). *Alcohol, Drugs and Driving – Abstracts & Reviews*, 2, 31-49.

Johnson, R., & Kaplan, H.B. (1990). Stability of Psychological symptoms: drug use consequences and intervening processes. *Journal of Health and Social Behavior*, 3:277-291.

Johnson, T.P., Houghland, J., & Clayton, R. (1989). Obtaining reports of sensitive behaviour: A comparison of telephone and face-to-face interviews. *Soc. Sci. Q* 70: 174-183.

Johnston L.D., O'Malley, P.M., & Bachman, J.G. (1993). *National survey results on drug use from the monitoring the future study, 1975-1992 Volume 1- secondary school students*. Rockville, M.D. NIDA.

Johnston L.D., O'Malley, P.M., & Bachman, J.G. (1994). *National survey results on drug use from the monitoring the future study, 1975-1993 Volume 2 college students and young adults* (NIH Publication No.94-3810: 160-164). Washington, DC: NIDA.

Johnston L.D., & O'Malley, P.M. (1986). Why do the nation's students use drugs and alcohol? Self reported reasons from nine national surveys. *Journal of Drug Issues*, 16, 29-66.

Johnston, L.D. & O'Malley, P.M. (1985). Issues of validity and population coverage in student surveys of drug use. In B.A. Rouse, N.J.Kozel & L.G. Richards (eds). *Self-report methods of estimating drug use: Meeting current challenges to validity* (NIDA Research monograph No. 57 (ADM) 85-1402). Washington, DC: U.S. Government Printing Office.

Johnston, L.D., O'Malley, P.M. & Bachman J.G. (1985). *Use of licit and illicit drugs by America's high school students. 1975-1984.* Rockville, MD: National Institute of Drug Abuse.

Johnston, L.D., O'Malley, P.M. & Bachman J.G. (1997). *National Survey Results on Drug Use from the Monitoring the Future Study, 1975-1996: Secondary School Students.* Rockville, MD: U.S. Department of Health and Human Services, National Institute on Drug Abuse.

Johnston, L.D., O'Malley, P.M. & Bachman J.G. (2000). *The monitoring the future National results on adolescent drug use: overview of key findings 1999.* US Department of health and human services, Public Health Service, National Institutes of Health, NIDA.

Jones, B.T., Corbin, W., & Fromme, K. (2001). A review of expectancy theory and alcohol consumption. Addiction, 96 57-72.

Jones, M.C. (1968). Personality correlates and antecedents of drinking patterns in adult males. *Journal of Consulting and Clinical Psychology*, 31, 1-12.

Jones, M.C. (1971). Personality antecedents and correlates of drinking patterns in women. *Journal of Consulting and Clinical Psychology*, 36, 61-69.

Jung, J. (1977). Drinking Motives and Behavior in Social Drinkers. *Journal of Studies on Alcohol*, 38 (5), 944-952.

Kamali, K., & Steer, R.A. (1976). Polydrug Use by High-School Students: Involvement and Correlates. *International Journal of the Addictions*, 11(2), 337-343.

Kandel, E.B. (1975). Stages in adolescent involvement in drug use, *Science*, 190, 912-914.

Kandel, D.B., Kessler, R., & Margulies, R. (1978). Antecedents of adolescent initiation into stages of drug use: a developmental analysis. *Journal of Youth and Adolescence*. 7, 13-40.

Kandel, D.B. (1980). Drug and drinking behaviour among youth. *Annual Rev. Sociology*, 6, 235-285.

Kandel, D.B. (1982). Epidemiological and psychosocial perspectives on adolescent drug use. *Journal of American Academic Clinical Psychiatry*, 21, 328-347.

Kandel, E.B. (1984). Homophily, selection and socialization in adolescent friendships. *American Journal of Sociology*, 4, 2, 427-436.

Kandel, D.B. (1985). On Processes of peer influences in adolescent drug use: a developmental perspective. *Advances in Alcohol and Substance Abuse*, 4(3-4), 139-163.

Kandel, D.B., Davies, M., Karus, D., & Yamaguchi, K. (1986). The consequences in young adulthood of adolescent drug involvement. *Archives of General Psychiatry*, 43, 746-754.

Kandel, D. B., & Andrews, K. (1987). Processes of adolescent socialization by parents and peers. *International Journal of the Addictions*. 22(4), 319-342.

Kandel, D.B. (1980). Drug and drinking behaviour among youth. *Annual Review of Sociology*, 6, 235-285.

Kandel, D.B., & Davies, M. (1992). Progression to regular marijuana involvement: Phenomenology and risk factors for near-daily use. In Glantz, M. D., & Pickens, R.W. (eds). *Vulnerability to drug abuse*. Washington, DC, USA: American Psychological Association.

Kandel, D.B., & Yamaguchi, K. (1993). From Beer to Crack: Developmental Patterns of Drug Involvement. *American Journal of Public Health*, 83 (6), 851-855.

Kandel, D.B. (1996). The parental and peer contexts of adolescent deviance: An algebra of interpersonal influences. *Journal of Drug Issues*. 26(2), 289-315.

Kandel, D.B., Johnson, J.G., Bird, H.R., Canino, G., Goodman, S.H., Lahey, B.B., Regier, D.A., & Schwabstone M.. (1997). Psychiatric disorders associated with substance use among children and adolescents: Findings from the Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study. *Journal of Abnormal Child Psychology*. 25(2), 121-132.

Kaplan, H.B., Martin, S.S., & Robbins, C. (1985). Toward an explanation of increased involvement in illicit drug use: Application of a general theory of deviant behavior. *Research in Community & Mental Health*. 5, 205-252.

Kaplan, H.B. (1987). Social sanctions, self-referent responses, and the continuation of substance abuse: A person environment interaction perspective. *Drugs & Society*. 2(1), 31-55.

Kaplan, H.B., Johnson, R.J., & Bailey, C.A., (1988). Explaining adolescent drug use: an elaboration strategy for structural equations modelling. *Psychiatry*, 51, 142-163.

Kapur, B.M. (1993) Drug-testing methods and clinical interpretations of test results. *Bulletin of Narcotics*, 45, 115-154.

Karvonen, S. (1995). Regional differences in drinking among Finnish adolescents. *Addiction*. 90(1), 57-64.

Kendler, K.S., Karkowski, L.M., Corey, L.A., Prescott, C.A., & Neale, M.C. (1999). Genetic and environmental risk factors in the aetiology of illicit drug initiation and subsequent misuse in women. *British Journal of Psychiatry*. 175, 351-356.

Kerlinger, F.N. (1973). *Foundations of Behavioural Research, 2nd Edition*, New York: Holt, Rinehart and Winston, Inc.

Khantzian, E.J. (1985). The self medication hypothesis of addictive disorders: focus on heroin and cocaine dependence. *American Journal of Psychiatry*, 142, 1259-1264.

Kirisci, L., Mezzich, A., & Tarter, R. (1995). Norms and sensitivity of the adolescent version of the drug use screening inventory, *Addictive Behaviors*, 20, 149-157.

Klein, H. (1992). Self-Reported Reasons for Why College Students Drink. *Journal of Alcohol and Drug Education*, 37, 14-28.

Kolb, B., & Wishaw, I.Q. (1989). *Fundamentals of Human Neuropsychology, 3rd edition.* USA: W.H. Freeman & Company.

Korf, D. (1997). The tip of the Iceberg: Snowball sampling and nomination techniques, the experience of Dutch studies. In Stimson, G.V., Hickman, M., Quirk, A., Frischer, M., & Taylor, C. (eds) *Estimating the prevalence of problem drug use in Europe.* EMCDDA Scientific Monograph Series, 1, EMCDDA.

Kosviner, A., & Hawks, D. (1977). Cannabis Use amongst British University Students: II. Patterns of Use and Attitudes to Use. *British Journal of Addiction*, 72, 41-57.

Kovach, J.A., & Glickman, N.W. (1986). Levels and Psychosocial correlates of adolescent drug use. *Journal of Youth and Adolescence*, 15 (1), 61-77.

Kumpfer, K.L. & Turner, C.W. (1991). The Social Ecology Model of Adolescent Substance Abuse: Implications for Prevention. *International Journal of the Addictions*, 25 (4A), 435-463.

Kumpfer, K.L., Olds, D.L., Alexander, J.F., Zucker, R.A., Gary, L.E. (1998). Family Etiology of Youth Problems. In Ashery, R.S., Robertson, E.B., & Kumpfer, K.L. (1998). *Drug Abuse Prevention Through Family Interventions*. NIDA Research Monograph 177, NIH, Rockville, MD.

Kushner, M.J., Sher, K.J., Wood, M.D., & Wood, P.K. (1994). Anxiety and drinking behavior: Moderating effects of tension-reduction alcohol outcome expectancies. *Alcoholism: Clinical and Experimental Research*, 18(4), 852-860.

Labouvie, E.W., & McGee, C.R. (1986). Relation of personality to alcohol and drug use in adolescence. *Journal of Consulting and Clinical Psychology*, 54, 289-293.

Lawson, G.W. & Lawson, A.Q., (eds) (1992). *Adolescent substance abuse: Etiology, treatment, and prevention.* Gaithersburg, MD, USA: Aspen Publishers, Inc.

Leigh, B.C. (1989). In search of the seven dwarves: Issues of measurement and meaning in alcohol expectancy research. *Psychological Bulletin*, 105, 361-373.

Lenton, S., Boys, A., Norcross, K. (1997). Raves, drugs and experience: drug use by a sample of people who attend raves in Western Australia. *Addiction*, 92 (10), 1327-1337.

Lloyd, C. (1998). Risk factors for Problem Drug Use: identifying vulnerable groups. *Drugs Education Prevention and Policy*, 5 (3), 217-232.

Lombillo, J.R., & Hain, J.D. (1972). Patterns of drug use in a High School population. *American Journal of Psychiatry*, 128 (7): 836-841.

Lopez, J.M.O., Redondo, L.M., & Martin, A.L. (1989). Influence of family and peer group on the use of drugs by adolescents. *International Journal of the Addictions*, 24 (11), 537-548.

Lynam, D.R, Milich, R., Zimmerman, R., Novak, S.P., Logan, T.K., Martin, C., Leukefeld, C. & Clayton, R. (1999). Project DARE: No effects at 10-year follow-up. *Journal of Consulting & Clinical Psychology*. 67(4), 590-593.

Maddahian, E., Newcomb, M.D. & Bentler, (1988). Adolescent drug use and intention to use drugs: concurrent and longitudinal analyses of four ethnic groups. *Addictive Behaviors*, 13, 191-195.

Magura, S., Freeman, R.C., Siddigi, Q., & Lipton, D.S. (1992). The validity of hair analysis for detecting cocaine and heroin use among addicts. *International Journal of the Addictions*, 27, 51-69.

Magura, S., Goldsmith, D., Casriel, C., Goldstein, P., & Lipton, D.S. (1987). The validity of methadone clients self reported drug use. *International Journal of the Addictions*, 22, 727-749.

Maisto, S.A., McKay, J.R., & Connors, G.J. (1990) Self-report issues in substance abuse: State of the art and future directions. *Behavioral Assessment*. 12(1), 117-134.

Malkus, B.M. (1994). Family dynamic and structural correlates of adolescent substance abuse: A comparison of families of non-substance abusers and substance abusers. *Journal of Child & Adolescent Substance Abuse*. 3(4), 39-52.

Malvin, J., & Moskowitz, J. (1983). Anonymous versus identifiable self-reports of adolescent drug attitudes, intentions and use. *Public Opin Q* 47, 557566.

Marlatt, G.A., & Rohsenow, D.J., .(1980). Cognitive processes in alcohol use: Expectancy and the balanced placebo design. In Mello, N.K. (ed.) *Advances in*

substance abuse: Behavioural and biological research. A research annual, Vol 1. Greenwich, CT. JAI Press.

Marlatt, G.A., Baer, J.S., Donovan, D.M., & Kivlahan, D.R. (1988). *Addictive Behaviors*: etiology and treatment. Annual Review of Psychology, 38, 575-630.

Marsden, J., Gossop, M., Stewart, D., Best, D., Farrell, M., Edwards, C., Lehmann, P. & Strang, J. (1998). The Maudsley Addiction Profile (MAP): A brief instrument for assessing treatment outcome. *Addiction*, 93, 1857-1867.

Marsden, J., Best, D., Boys, A., Strang, J., Manning, V., Ettalini, T., McKeganey, N., Barnard, M., Sumpton, D., Evans, V., Dale-Perera, A. (2000). *Feasibility study for a National Evaluation of Drug Education in English Schools.* Final Report to the Department for Education & Employment, Home Office and Department of Health, National Addiction Centre, London.

Martin, C.S., Clifford, P.R., & Clapper, R.L. (1992). Patterns and predictors of simultaneous and concurrent use of alcohol, tobacco, marijuana and hallucinogens in first-year college students. *Journal of Substance Abuse*, 4, 319-326.

Martin, C.S., Langenbucher, J.W., Kaszynski, N.C (1995). Onset and staging of DSM-IV alcohol abuse and dependence symptoms in adolescent drinkers, *Alcoholism: Clinical Experimental Research,* 19(2), 40A.

McAllister, P. & Davies, J.B. (1992). Attributional bias as a function of clinical classification. *Drug Issues*, 22 (1), 139-153.

McCallum, T., Christie, A., Ashfield, J., Pickup, M., Colvin, A., Bonnitcha, J., & Bohr, M. (1998). *Drug use by young females*. Health Education Unit, University of Sydney, New South Wales.

McElrath, K. (1994). A comparison of two methods for examining inmates' self-reported drug use. *International Journal of the Addictions*. 29(4), 517-524.

McKay, J.R., Murphy, R.T., McGuire, J., Rivinus, T.R., & Maisto, S.A. (1992). Incarcerated adolescents' attributions for drug and alcohol use. *Addictive Behaviors*, 17, 227-235.

McKeganey, N., & Barnard, M., (1992). Selling sex: Female street prostitution and HIV risk behaviour in Glasgow. *AIDS Care*, 4 (4), 395-407.

McKeganey, N. (1995). Quantitative and qualitative research in the addictions: an unhelpful divide. *Addiction*, 90, 749-751.

McMillen, B. (1997). *The Psycho-social determinants of drug use amongst young people.* PhD Thesis, University of Leeds.

McPhillips, M.A., Strang, J., & Barnes, T.R.E., (1998). Hair apparent: new laboratory ability to test for substance use. *British Journal of Psychiatry*. 173, 287-290.

Measham, F. (1995). Equality in ecstasy and excess? Young women and drugs. *Criminal Justice Matters*, 19, 10-11.

Measham, F., Newcombe, R., & Parker, H.(1994). The normalization of recreational drug use amongst young people in North-West England. *British Journal of Sociology*, 45,2, 287-312.

Measham, F., Parker, H., & Aldridge, J. (1998). The teenage transition: from adolescent recreational drug use to the young adult dance culture in Britain in the mid-1990s. *Journal of Drug Issues*, 28, 9-32.

Measham, F., Aldridge, J., & Parker, H. (2001). Unstoppable? Dance Drug Use in the UK Club Scene. In Parker, H., Aldridge, J., & Egginton, R. (eds). *UK Drugs Unlimited: new research and policy lessons on illicit drug use*. Palgrave, Hampshire.

Mechanic, D., & Cleary, P (1984). Factors associated with the maintenance of positive health behavior. *Preventive Medicine*, 9, 805-814.

Meltzer, H., Bill, B., Petticrew, M & Hinds, K. (1995). *The prevalence of psychiatric morbidity among adults living in private households*. London: HMSO.

Mensch, B. & Kandel, D. (1988). Underreporting of Substance Use in a National Longitudinal Youth Cohort. *Public Opinion Quarterly*, Spring, 100-124.

Metzler, C., Noell, J., Biglan, A., Ary, D.V., & Smolkowski, K. (1995). Peer and parental influences on adolescent tobacco use. *Journal of Behavioural Medicine*, 18, 315-330.

Mieczkowski, T. (1991). The accuracy of self-reported drug use: An evaluation and analysis of new data. In Weisheit, R., (ed). *Drugs, Crime and the Criminal Justice System.* Cincinnati, OH: Anderson Publishing Co.

Miller, P.M., Smith, G.T., & Goldman, M.S. (1990). Emergence of alcohol expectancies in childhood: a possible critical period. *Journal of Studies on Alcohol*, 51, 343-349.

Miller, W.R. & Rollnick, S. (1991). *Motivational Interviewing: preparing people to change addictive behaviour*. Guilford Press, York.

Miller, P.Mc., & Plant, M. (1996). Drinking, smoking and illicit drug use among 15 and 16 year olds in the United Kingdom. *British Medical Journal*, 313, 394-397.

Mitchell, S.H., Laurent, C.L., & de Wit, H. (1996). Interaction of expectancy and the pharmacological effects of d-amphetamine: subjective effects and self-administration. *Psychopharmacology*, 125, 371-378.

Moffitt, T.E. (1997). Adolescence-Limited and Life-Course-Persistent Offending: A complementary Pair of Developmental Theories. In Thornberry, T.P. (ed). *Developmental Theories of Crime and Delinquency. Advances in Criminological Theory, vol. 7.* Transaction publishers, New Jersey.

Mooney, D.K., Fromme, K., Kivlahan, D.R., & Marlatt, G.A. (1987). Correlates of alcohol consumption: sex, age and expectancies relate differentially to quantity and frequency. *Addictive Behaviors*, 12, 235-240.

Moore, D. (1993). Ethnography and illicit drug use: dispatches from an anthropologist in the field. *Addiction Research*, 1, 11-15.

Morgan, M., Hibell, B., Andersson, B,. Bjarnason, T., Kokkevi, A,. & Narusk, A. (1999). The ESPAD study: implications for prevention. *Drugs: Education Prevention & Policy*. 6(2), 243-256.

Mott, J. & Mirlees-Black, C. (1995). *Self-reported drug misuse in England and Wales. Main findings from the 1992 British Crime Survey*. London: Home Office Research and Statistics Department.

Mrazek, P.J., & Haggerty, R.J. (eds). (1994). *Reducing the Risk for Mental Disorders: Frontiers for Preventive Intervention Research*. Washington, D.C: National Academy Press for the Institute of Medicine, Committee on Prevention of Mental Disorders.

Mulford, H., & Miller, D. (1960). Drinking in Iowa: III. A scale of definitions of alcohol related to drinking behavior. Quarterly *Journal of Studies on Alcohol*, 21, 267-278.

Mulford, H. (1983). Stress, alcohol intake and problem drinking in Iowa. In Pohorecky, L., & Brick, J. (eds). *Stress and alcohol use – proceedings of the first International Symposium on Stress and Alcohol Use*. New York: Elsevier.

Mullen, P.C., Hersey, J.C., & Iverson, D.C. (1987). Health behavior models compared. *Social Science and Medicine*, 24, 973-83.

Murray,C. J. L. & Lopez, A.D. (1996). Quantifying the burden of disease and injury attributable to ten major risk factors. In C.J.L. Murray & A.D. Lopez (eds), *The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020* (p.295-324). Cambridge, M.A: Harvard School of Public Health.

Murry, D.M., & Perry, C.L. (1984). The prevention of adolescent drug abuse: implications of etiological, developmental, behavioural and environmental models. In C.L. Jones & R.J. Battjes (eds.). *Etiology of drug abuse* (p.236-256) Rockville, MD: National Institute on Drug Abuse.

Nabben, T., & Korf, D.J. (2000). *The combi high: combined use of alcohol with cannabis, cocaine, XTC and amphetamine*. Report, Amsterdam.

Nathan, P.E. (1988). The addictive personality is the behaviour of the addict. *Journal of Consulting & Clinical Psychology*, 56, 183-188.

National Institute on Alcohol Abuse and Alcoholism, (1990). *Seventh special report to the U.S. Congress on alcohol and health*. Washington, DC: U.S. Government Printing Office.

National Institute on Drug Abuse (1997). *Preventing Drug Abuse Among Children and Adolescents*. Rockville, MD: National Institutes of Health publication.

Newcomb. M.D., Huba, G.J. & Bentler, P.M. (1983). Mothers' influence on the drug use of their children: confirmatory tests of direct modelling and mediational theories. *Developmental Psychology*, 19, 714-726.

Newcomb M.D. & Bentler, P.M. (1986). Drug use, educational aspirations, and work-force involvement: the transition from adolescence to young adulthood. *American Journal of Community Psychology*, 14, 303-321.

Newcomb, M.D., Huba, G.J., & Bentler, P. M. (1986). Desirability of various life change events among adolescents: Effects of exposure, sex, age, and ethnicity. *Journal of Research in Personality*. 20(2), 207-227.

Newcomb, M.D. & Bentler, P.M. (1988a). *Consequences of adolescent drug use: impact on the lives of young adults*. Newbury Park, CA: Sage.

Newcomb, M.D. & Bentler, P.M. (1988b). Impact of adolescent drug use and social support on problems of young adults: a longitudinal study. *Journal of Abnormal Psychology*, 97, 64-75.

Newcomb. M.D., Chou, C-P., Bentler, P.M. & Huba, G.J. (1988). Cognitive motivations for drug use among adolescents: Longitudinal tests of gender differences and predictors of change in drug use. *Journal of Counselling Psychology*, 35, 426-438.

Newcomb, M.D. & Bentler, P.M. (1989). Substance use and abuse among children and teenagers. *American Psychologist*, 44 , 242-248.

Newcomb, M.D. & Bentler, P.M. (1990). Antecedents and consequences of cocaine use: an eight-year study from early adolescence to young adulthood. In: Robins, L. (ed) *Straight and Devious Pathways from Childhood to Adulthood*. New York: Cambridge Press.

Newcomb, M.D., & Felix-Ortiz, M. (1992). Multiple protective and risk factors for drug use and abuse: Cross-sectional and prospective findings. *Journal of Personality & Social Psychology*. 63(2), 280-296.

Newcomb, M.D. & Earleywine, M. (1996). Intrapersonal contributors to drug use: The willing host. *American Behavioral Scientist*. 39(7), 823-837.

Newcomb, M.D. & Richardson, M.A. (2000). Substance use disorders. In: Hersen, M., & Ammerman, R.T. (eds) *Advanced Abnormal Child Psychology*. (2nd ed.). (*p*. 467-492). Mahwah, NJ, US: Lawrence Erlbaum Associates.

Newcomb, M.D. (1992). Understanding the multidimensional nature of drug use and abuse: the role of consumption, risk factors and protective factors. In Glantz, M.D., & Pickens, R. (eds) *Vulnerability to drug abuse* (p. 255-298). Washington, DC: American Psychological Association.

Newcomb, M.D. (1997). Psychosocial predictors and consequences of drug use: a developmental perspective within a prospective study. *Journal of Addictive Diseases*, 16, 51-89.

Newcomb, M.D. (1995). Identifying high-risk youth: prevalence and patterns of adolescent drug abuse. In Rahdert, E., & Chzechowicz, D., (eds). *Adolescent drug abuse: clinical assessment and therapeutic interventions.* National Institute on Drug Abuse Research Monograph 156, US Dept Health and Human Services, NIH, NIDA, Rockville, M.D.

Norman, P., & Smith, L. (1995). The theory of planned behaviour and exercise: an investigation into the role of prior behaviour, behavioural intentions and attitude variability. *European Journal of Social Psychology*, 25, 403-15.

Norusis, M.J., SPSS Inc. (1990). *SPSS/PC+ Statistics 4.0 for the IBM PC/XT/AT and PS/2*. SPSS Inc, Chicago, Illinois.

Novacek, J., Raskin, R., & Hogan, R. (1991). Why do Adolescents Use Drugs? Age Sex and User differences. *Journal of Youth and Adolescence*, 20 (5), 475-492.

Nurco, D. (1985). A discussion of validity. In Rouse, B.A., Kozel, N.J. & Richards, L.G. (eds). *Self report methods of estimating drug use: meeting current challenges to validity.* (NIDA Research Monograph 57) 4-11. Rockville, MD: National Institute on Drug Abuse.

O'Connor, L., Best, D., Best, R., & Rowley, J. (1998). Missed opportunities: Drugs and Drug Education. *Early Child Development and Care*, 141, 73-109.

Oei, T.P.S., & Baldwin, A.R. (1994). Expectancy Theory: a two-process model of alcohol use and abuse. *Journal of Studies on Alcohol*, 55, 525-534.

Oetting E.R., & Beauvais, F. (1990). Adolescent Drug Use: Findings of National and Local Surveys. *Journal of Consulting and Clinical Psychology*, 58, 4 ,385-394.

Oetting, E.R., & Beauvais, F. (1986). Peer cluster theory: Drugs and the adolescent. *Journal of Counselling and Development*, 65, 17-22.

Oetting, E.R., & Beauvais, F. (1987). Peer cluster theory; socialization characteristics, and adolescent drug use: a path analysis. *Journal of Counselling Psychology*, 34, 205-213.

Oetting, E.R. (1996). Risk and protective factors in the etiology of substance abuse. *Invited paper at the National Institute on Drug Abuse Perspectives on Rural Drug Abuse Symposium, Holiday Inn Gateway Cente*r, Ames, Iowa, May 22 1996.

O'Farrell, T.J., & Maisto, S.A., (1987). The utility of self-report and biological measures of alcohol consumption in alcoholism treatment outcome studies. *Advances in Behaviour Research & Therapy*. 9(2-3), 91-125.

OPCS (1980) *Classification of Occupations 1980*. London: HMSO.

Orford, J., & Keddie, A. (1985). Gender differences in the functions and effects of moderate and excessive drinking. *British Journal of Clinical Psychology*, 24, 265-279.

Paglia, A., & Room, R. (1998). *Preventing substance-use problems among youth: a literature review and recommendations*. ARF Research document series, No. 142, Addiction Research Foundation, Toronto.

Pandina, R.J., (1996). Risk and Protective Factor Models in Adolescent Drug Use: Putting Them to Work for Prevention. *Plenary Session, National Conference on Drug Abuse Prevention Research: September 19-20, 1996,* Washington, D.C.

Pang, M.G., Wells-Parker, E., McMillen, D.L. (1989). Drinking Reasons, Drinking Locations and Automobile Accident Involvement Among Collegians. *International Journal of the Addictions*, 24 (3), 215-227.

Parker, H., Bakx, K., & Newcombe, R. (1988). *Living with Heroin: the impact of a heroin epidemic on an English community.* Open University Press, Buckingham.

Parker, H., & Measham, F. (1994). Pick 'n' Mix: changing patterns of illicit drug use amongst 1990s adolescents. *Drugs: Education prevention and policy,* 1 (1), 5-13.

Parker, H., Measham, F., & Aldridge, J. (1995). *Drugs Futures: changing patterns of drug use amongst English youth*. ISDD Research Monograph 7, ISDD, London.

Parker, H., Aldridge, J., & Measham, F. (1998). *Illegal leisure: the normalization of adolescent recreational drug use*. Routledge, London.

Parker, H., Egginton, R., & Bury, C. (1998b). *New Heroin Outbreaks Amongst Young People in England and Wales at the end of the 1990s*, London: Report to the Police Research Group, Home Office.

Parker, H., Egginton, R., & Elson, N. (2001a). Unreachable? The New Young Heroin Users. In Parker, H., Aldridge, J., & Egginton, R. (eds). *UK Drugs Unlimited: new research and policy lessons on illicit drug use*. Palgrave, Hampshire.

Parker, H. (2001). Unbelievable? The UK's Drugs Present. In Parker, H., Aldridge, J., & Egginton, R. (eds). *UK Drugs Unlimited: new research and policy lessons on illicit drug use*. Palgrave, Hampshire.

Patton, M.Q. (1990). *Qualitative Evaluation and Research Methods*. 2nd Edition, Sage publications, Newbury Park, London.

Pavis, S., Cunningham-Burley, S., & Amos, A. (1997). Alcohol consumption and young people: exploring meaning and social context. *Health Education Research,* 12(3), 311-322 .

Pearson, G. (1987). *The New Heroin Users*. Basil Blackwell, Oxford.

Peele, S. (1987). What can we expect from treatment of adolescent drug and alcohol abuse? *Paediatrician*, 14, 62-69.

Pentz, M.A., Dwyer, J.H., MacKinnon, D.P., Flay, B.R., Hansen, W.B., Wang, E.Y., & Johnson, C.A. (1989). A multicommunity trial for primary prevention of adolescent drug abuse. *JAMA*, 261, 22, 3259-3267.

Peters, R.S. (1960). *The concept of motivation*. Routledge & Kegan Paul, London, England.

Plant, M.A., Bagnall, G., & Foster, J. (1990). Teenage Heavy Drinkers: Alcohol-related Knowledge, Beliefs, Experiences, Motivation and the Social Context of Drinking. *Alcohol & Alcoholism*, 25(6), 691-698.

Plant, M.A., Peck, D.F. & Samuel, E. (1985). *Alcohol, drugs and school-leavers.* Tavistock Publications, London.

Pollock, V.E.(1992). Meta-Analysis of Subjective Sensitivity to Alcohol in Sons of Alcoholics. *American Journal of Psychiatry*. 149(11), 1534.

Power, R. (1994). Some methodological and practical implications of employing drug users as indigenous fieldworkers. In Boulton, M. (ed). *Challenge and Innovation: methodological advances in social research on HIV/AIDS,* Taylor & Francis: London: 97-111.

Power, R., Jones, S., Kearns, G., & Ward, J. (1995a). *Coping With Illicit Drug Use.* London: Tufnell Press.

Power, R., Green, A., Pickering, H., & Stimson, G.V. (1995b). A Qualitative Study of the Purchasing and Distributing Patterns of Cocaine and Crack Users in England and Wales. *Addiction Research*. 2(4), 363-379.

Power, R. (1995). Quantitative and qualitative research in the addictions: an unhelpful divide: comment. *Addiction*, 91 (1), 146-147.

Power, R., Power, T., & Gibson, N. (1996). Attitudes and experience of drug use amongst a group of London teenagers. *Drugs: Education, Prevention and Policy* 3 (1), 71-80,.

Prendergast, M.L. (1994). Substance Use and Abuse Among College Students: A review of Recent Literature. *Journal of American College Health*. 43(3), 99-113.

Rachal, J.V., Guess,L.L., Hubbard, R.L. & Maisto, S.A. (1982). Facts for planning No. 4: Alcohol misuse by adolescents. *Alcohol Health and Research World*, 6(3), 61-68.

Ramsay, M., & Partridge, S. (1999). *Drug Misuse Declared in 1998: results from the British Crime Survey*. Home Office Research Study 197. London: Home Office.

Ramsay, M., & Percy, A. (1996). *Drug use declared: results of the 1994 British Crime Survey.* London: Home Office.

Ramsay, M., & Spiller, J. (1997). *Drug Misuse Declared in 1996: latest results from the British Crime Survey*. Home Office Research Study 172. London: Home Office.

Ratliff, K.G., & Burkhart, B.R. (1984). Sex Differences in Motivations for and Effects of Drinking among College Students. *Journal of Studies on Alcohol*, 45 (1), 26-32.

Reeves, D.W., & Draper, T.W. (1984). Abstinence or Decreasing Consumption among Adolescents: Importance of Reasons. *International Journal of the Addictions*, 19 (7), 819-825.

Reilly, C.J., & Homel, P.J. (1987). *1986 Survey of recreational drug use and attitudes of 15 to 18 year olds in Sydney*. Sydney: Directorate of the Drug Offensive. (in-house report no. A87/4).

Reiss, D., & Price, R.H. (1996). National Research Agenda for Prevention Research: the National Institute of Mental Health Report. *American Psychologist*, 51 (11), 1109-1115.

Release, (1997). *Release Drugs and Dance Survey: an insight into the culture*. London: Release.

Rhodes, T. (1995). Researching and theorising 'risk': notes on the social relations of risk in heroin users' lifestyles. In Aggleton, P., Hart, G., & Davies, P. (eds). *AIDS: Sexuality, Safety and Risk*. London: Taylor & Francis.

Rhodes, T. (1997). Risk theory in epidemic times: sex, drugs and the social organisation of risk behaviour. *Sociology of Health and Illness*, 19, 208-227.

Rhodes, T. (2000). The multiple roles of qualitative research in understanding and responding to drug use, in Fountain, J. (ed): *Understanding and responding to drug use: the role of qualitative research*. EMCDDA scientific monograph series. EMCDDA: Lisbon.

Rhodes, T., Cusick, L. & Henderson, S. (2000). Profile of qualitative research in the UK. *http://www.qed.org.uk/profiles/uk.html*.

Riley, J., Marden, C., & Lifshitx, M. (1948). The motivational pattern of drinking. Quarterly *Journal of Studies on Alcohol*, 9, 353-362.

Robbins, E.S., Robbins, L., Frosch, W.A., Stern, M. (1970). College student drug use. *American Journal of Psychiatry*, 126 (12),1743-1751.

Robins, LN., & Przybeck, T.R., (1985). *Age of onset of drug use as a factor in drug and other disorders*. National Institute on Drug Abuse: Research Monograph Series. No 56, 178-192.

Roehling, P.V., Smith, G.T., Goldman, M.S., & Christiansen, B.A. (1987). Alcohol expectancies predict adolescent drinking: a three year longitudinal study. Paper presented at the *95th Annual Convention of the American Psychological Association*, New York City.

Roffman, R.A., & Barnhart, R. (1987). Assessing need for marijuana dependence treatment through an anonymous telephone interview. *International Journal of the Addictions*. 22(7), 639-651.

Rosenbaum, D.P., Flewelling, R.P., Bailey, S.L., Ringwalt, C.L., & Wilkinson, D.L. (1994). Cops in the classroom: A longitudinal evaluation of Drug Abuse Resistance Education (D.A.R.E.). *Journal of Research in Crime and Delinquency*, 31, 3–31.

Royal College of Psychiatrists and Royal College of Physicians (2000). *Drugs: Dilemmas and choices.* London: Gaskell.

Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry* 57 (3), 316-331.

Rutter, M. (1990). Psychosocial resilience and protective mechanisms. In Rolf, J., Masten, A.S., Cicchetti, D., Nuechterlein, K.H., & Weintraub, S., *Risk and protective factors in the development of psychopathology.* Cambridge, England: Cambridge University Press.

Rutter, M. (1993). Some conceptual considerations. *Journal of Adolescent Health*, 14, 626-631.

Sadava, S.W. (1971). A field-theoretical study of college student drug use. *Canadian Journal of Behavioral Science*, 3, 337-346.

Sadava, S.W. (1973). Patterns of College Student Drug Use: A Longitudinal Social Learning Study. *Psychological Reports*, 33, 75-86.

Sadava, S.W. (1974). A conceptual framework for research in the patterns and meanings of drug use. *JSAS Catalogue of Selected Documents in Psychology*, 4,11.

Sadava, S.W. (1975). Research approaches in illicit drug use: a critical review. *Genetic Psychology Monographs*, 91, 3-59.

Sadava, S.W. (1985). Problem behaviour theory and consumption and consequences of alcohol use. *Journal of Studies on Alcohol*, 46, 392-397.

Sadava, S.W., & Forsyth, R. (1977). Person-Environment interaction and college student drug use: a multivariate longitudinal study. *Genetic Psychology Monographs*, 96, 211-245.

Schafer, J., & Brown, S.A. (1991). Marijuana and Cocaine Effect Expectancies and Drug Use Patterns. *Journal of Consulting and Clinical Psychology*, 59 (4), 558-565.

Schaps, E., Moskowitz, J.M., Malvin, J.H., Schaeffer, G.A. (1986). Evaluation of seven school-based prevention programs: a final report of the Napa Project. *International Journal of the Addictions*, 21(9&10), 1081-1112.

Schober, S.E., Fe Caces, M., Pergamit, M. R., & Branden, L. (1992). *The effect of Interview administration method on reported illicit drug use.* Working Paper, National Institute on Drug Abuse.

Schuckit, M. (1994). Low level of response to alcohol as a predictor of future alcoholism. *American Journal of Psychiatry*. 151(2), 184-189.

Schuman, H., and Presser, S. (1981). *Questions and answers in Attitude Surveys.* Academic Press inc. London.

Schutz, C.G., & Chilcoat, H.D. (1994). Breach of Privacy in surveys on adolescent drug use: a methodological inquiry. *International Journal of Methods in Psychiatric Research*, 4, 183-188.

Schwandt, T.A. (1997). *Qualitative Inquiry – a Dictionary of terms.* Sage Publications.

Segal, B. (1985-86). Confirmatory analyses of reasons for experiencing psychoactive drugs during adolescence. *International Journal of the Addictions*, 20 (11&12), 1649-1662.

Segal, B., & Singer, J.L. (1976). Daydreaming, drug and alcohol use in college students: a factor analytic study. *Addictive Behaviors*, 1, 227-235.

Segal, B. (1986a). Intervention and prevention of drug-taking behaviour: a need for divergent approaches. *International Journal of the Addictions*, 21 (2), 165-173.

Segal, B. (1986b). Age and first experience with psychoactive drugs. *International Journal of the Addictions*, 21 (12), 1285-1306.

Segal, B. (1991). Adolescent Initiation into drug-taking behavior: comparisons over a 5-year interval. *International Journal of the Addictions*, 26 (3), 267-279.

Segal, B., Huba, G.J. & Singer, J.L. (1980a). Reasons for drug and alcohol use by college students. *International Journal of the Addictions*, 15, 489-498.

Segal, B., Huba, G.J., & Singer, J.L. (1980b). *Drugs, Daydreaming and Personality: A study of College Youth.* Hillsdale, N.J.: Erlbaum, 1980.

Segal, B., Cromer, F., Hubfoll S., & Wasserman, P. (1982). Patterns of reasons for drug use among detained and adjudicated juveniles. *International Journal of the Addictions*, 17 (7), 1117-1130.

Segal, B., Kelvy, MC., Mala, J., & Bowman, D. (1983). *Drug-taking behaviour in Alaska: a statewide study of selected communities.* Anchorage, AK: Center for Alcohol and Addiction Studies, University of Alaska.

Segal, B. (1990). *The Drunken Society.* Hippocrene, New York.

Segal, B., & Stewart, J.C. (1996). Substance use and abuse in adolescence: an overview. *Child Psychiatry and Human Development*, 26(4), 193-210.

Sharp, D.J., & Lowe, G. (1989). Asking young people why they drink, Paper presented at the *British Psychological Society Scottish Branch Annual Conference, Sept. 1989*, University of Strathclyde.

Shearin, R.B., & Jones, R.L. (1987). Drug and alcohol abuse: medical and psychosocial aspects. In Hofmann, A.D., Greydanus, D.E. (eds) *Adolescent Medicine, 2nd ed.*, Appleton & Lange, Norwalk, Ct.

Shedler, J., & Block, J. (1990). Adolescent Drug Use and Psychological Health: A Longitudinal Inquiry. *American Psychologist*, 45 (5), 612-630.

Sheehan, M., Oppenheimer, E. & Taylor, C. (1988). Who comes for treatment: drug misusers at three London agencies. *British Journal of Addiction*, 83, 311-320.

Sheppard, M.A., Wright, D., & Goodstadt, M.S. (1985). Peer Pressure and drug use: Exploding the myth. *Adolescence,* 20 (80), 949-958.

Sher, K.J. (1991). *Children of alcoholics: a critical appraisal of theory and research.* Chicago, IL, USA: University of Chicago Press.

Sher, K.J., Walitzer, K.S., Wood, P.K., & Brent, E.E. (1991) Characteristics of children of alcoholics: Putative risk factors, substance use and abuse, and psychopathology. *Journal of Abnormal Psychology*. 100(4), 427-448.

Sherman, S.L., Presson, C.C., Chassin, L., Corty, E., & Olshavsky, R. (1983). The false consensus effect in estimates of smoking prevalence: underlying mechanisms. *Personality and Social Psychology Bulletin*, 9, 197-208.

Shrum, W., & Cheek, N. (1987). Social structure during the school years: onset of the degrouping process. *American Sociological Review*, 52, 218-223.

Simons, J., Correian, C.J., & Carey, K.B. (2000). A comparison of motives for marijuana and alcohol use among experienced users *Addictive Behaviors*, 25 (1), 153-160.

Simons-Morton, B.G., Crump, A.D., Haynie, D.L., & Saylor, K.E. (1999). Student-school bonding and adolescent problem behavior. *Health Education Research: Theory and Practice.* 14 (1), 99-107.

Smith, J.A. (1995). Semi-structured interviewing and qualitative analysis. In Smith, J.A., Harre, R., & Langehove, L.V. (eds). *Rethinking methods in Psychology*, 9-26, Sage publications, London.

Smith, G.T., Roehling, P.V., Christiansen, B.A., & Goldman, M.S. (1986). Alcohol expectancies predict early adolescent drinking: a longitudinal study. Paper presented at the *94th Annual Convention of the American Psychological Association*, Washington, DC.

Smith, M.J., Abbey, A., & Scott, R.O. (1993). Reasons for Drinking Alcohol: Their Relationship to Psychosocial Variables and Alcohol Consumption. *International Journal of the Addictions*, 28 (9), 881-908.

Snow, R.W., & Wells-Parker, E. (1986). Drinking reasons, alcohol consumption levels and drinking locations among drunken drivers. *International Journal of the Addictions*, 21, 671-689.

Sobell, L.C., Maisto, S.A., Sobell, M.B. & Cooper, A.M. (1979). Reliability of alcohol abusers' self-reports of drinking behavior. *Behaviour Research and Therapy*, 17, 157-160.

Sobell, L.C., & Sobell, M,B (1990). Self-report issues in alcohol abuse: State of the art and future directions. *Behavioral Assessment.* 12(1), 77-90.

Sobell, L.C., & Sobell, M,B. (1992). Timeline Follow-Back: A technique for assessing self-reported alcohol consumption. In: Litten, R.Z., & Allen, J.P. (eds). *Measuring Alcohol Consumption, Psychosocial and Biomedical Methods*. Humana Press, p. 41-72, Totowa, NJ.

Spooner, C., Flaherty, B., & Homel, P. (1992). *Results of a street intercept survey of young illicit drug users in Sydney.* Directorate of the Drug Offensive, report A 92/1. N.S.W. Department of Health.

Spooner, C. & Flaherty, B. (1992). *Comparison of data collection methodologies for the study of young illicit drug users.* Directorate of the Drug Offensive, report A 92/2. N.S.W. Department of Health.

Spooner, C., Hall, W., & Lynskey, M. (2001 forthcoming). *Structural determinants of youth drug use.* Prepared for the Australian National Council on Drugs, National Drug & Alcohol Research Centre, University of New South Wales, Sydney.

Stacy, A.W., & Newcomb, M.D. (1999). Adolescent drug use and adult drug problems in women: direct, interactive and mediational effects. *Experimental and Clinical Psychopharmacology,* 7 (2), 160-173.

Stacy, A.W., Newcomb, M.D., & Bentler, P.M. (1991). Personality, problem drinking and drunk driving: mediating, moderating and direct-effect models. *Journal of Personality and Social Psychology*, 60, 795-811.

Stacy, A.W., Bentler, P.M. & Flay, B.R. (1994). Attitudes and health behaviour in diverse populations: drunk driving, alcohol use, binge eating, marijuana use and cigarette use. *Health Psychology*, 13, 1-13.

Stacy, A.W., Newcomb, M.D., & Bentler, P.M. (1995). Expectancy in mediational models of cocaine use. *Personality and Individual Differences*, 19 (5) 655-667.

Stacy, A.W., Widaman, K.F., & Marlatt, F.A. (1990). Expectancy models of alcohol use. *Journal of Personality and Social Psychology*, 58, 918-928.

Stenbacka, M., Allebeck, P., & Romelsjo, A. (1993). Initiation into drug abuse: The pathway from being offered drugs to trying cannabis and progression to intravenous drug abuse. *Scandanavian Journal of Social Medicine,* 21 (1), 31-39.

Stephens, R. (1972). The truthfulness of addict respondents in research projects. *International Journal of the Addictions*, 7 (3), 549-558.

Stevens, J. (1996). *Applied multivariate statistics for the social sciences* (3rd Edition). Lawrence Erlbaum, New Jersey.

Stewart, D.C., & Brown, S.A. (1995). Withdrawal and dependency symptoms among adolescent alcohol and drug abusers. *Addiction*, 90 (5), 627-635.

Stewart, D., Gossop, M., Marsden, J., & Rolfe, A. (2000). Drug misuse and acquisitive crime among clients recruited to the National Treatment Outcome Research Study. *Criminal Behaviour and Mental Health*, 10, 10-20.

Stillwell, G., Heathcote-Elliot, C., & Marsden, J. (2000). *An evaluation of a brief intervention model for use with young non-injecting stimulant users: study protocol.* National Addiction Centre, London.

Strang, J., Black, J., Marsh, A., & Smith, B. (1993). Hair analysis for drugs: technological breakthrough or ethical quagmire? *Addiction*. 88, 165-168.

Sutherland, I., & Sheppherd, J. (2000). Substance use seems to be increasing among 11 year olds. *British Medical Journal*, 321, 1161-1161.

Sutton, S. (1994). The past predicts the future: interpreting behaviour-behaviour relationships in social psychological models of health behaviours. In D.R. Rutter and L. Quine (eds). *Social Psychology and Health: European perspectives*. (p71-88) Aldershot: England.

Sutton, S. (1998). Predicting and Explaining Intentions and Behavior: How Well Are We Doing? Journal of Applied Social Psychology, 28(15), 1317-1338.

Swadi, H., & Zeitlin, H. (1988). Peer influence and adolescent substance abuse: a promising side? *British Journal of Addiction*, 83, 153-157.

Swadi, H. (1988). Adolescent drug taking: role of family and peers. *Drug and Alcohol Dependence*, 21, 157-160.

Swadi, H. (1997). Substance Misuse in Adolescence Questionnaire (SMAQ): a pilot study of a screening instrument for problematic use of drugs and volatile substances in adolescents, *Child Psychology and Psychiatry Review*, 2, 63-67.

Swadi, H. (1999). Individual risk factors for adolescent substance use. *Drug and Alcohol Dependence*, 55 (3), 209-224.

Swan, N. (1998). Drug Abuse Cost to Society Set at $97.7 Billion, continuing Steady Increase Since 1975. *NIDA Notes*, 13 (4), 1-13.

Tabachnick, B.G. & Fidell, L.S. (1989). *Using Multivariate Statistics. (Second edition).* New York: HarperCollins.

Tabachnick, B.G. & Fidell, L.S. (1996). *Using Multivariate Statistics. (Third edition).* New York: HarperCollins.

Tasker, T., Raw, M., McNeill, A., O'Muircheartaigh, C., Bowden, C., & Heuston, J. (1999). *Drug Realities: a summary of the key findings of the 1996 National Drugs Campaign Survey.* Health Education Authority, London.

Taylor, A., Frischer, M., McKeganey, N. Goldberg, D. J., et al. (1993). HIV risk behaviours among female prostitute drug injectors in Glasgow. *Addiction.* 88(11), 1561-1564.

Teichman, M., Barnea, Z., & Ravav, G. (1989). Personality and substance use among adolescents: A longitudinal study. *British Journal of Addiction.* 84(2), 181-190.

Thomas, B.S. (1997). Direct and Indirect effects of selected risk factors in producing adverse consequences of drug use. *Substance Use and Misuse*, 32, (4), 377-398.

Thombs, D.L., & Beck, K.H., (1994). The social context of four adolescent drinking patterns. *Health Education Research.* 9(1), 13-22.

Toneatto, T. (1995). The Regulation of Cognitive States: A Cognitive Model of Psychoactive Substance Abuse. *Journal of Cognitive Psychotherapy: An International Quarterly,* 9(2), 93-103.

Toohey, J.V., Dezelsky, T.L. & Baffi, C.R. (1982). The social attitudes of college students toward marijuana: Implications for education. *Journal of Drug Education*, 12 (2), 155-161.

Traub, S.H. (1983). Characteristics of female college student drug use. *Journal of Drug Education*, 13 (2), 177-186.

Turner, C.F., Lessler, J.T. & Gfroerer, J.C., (Eds). (1992). *Survey Measurement of Drug Use: Methodological Studies.* US Department of Health and Human Services Public Health Service Alcohol, Drug Abuse and Mental Health Administration, DHHS Publication No. (ADM)92-1929.

Tyler, A. (1995). *Street drugs: the facts explained, the myths exploded.* Revised edition. Hodder & Stoughton, London.

UKADCU (1998). *Tackling Drugs to Build a Better Britain: The Government's 10-year Strategy for Tackling Drug Misuse.* London, HMSO.

UKADCU (1999). *First Annual Report and National Plan.* London, HMSO.

UKADCU (2000). *First Annual Report on Tackling Drug To Build a Better Britain.* London, HMSO.

UKADCU (2001). *Young Peoples Substance Misuse Plans: DAT Guidance.* London, HMSO.

UNDCP (1999a). *Terminology and Information on Drugs: revised edition*, New York.

UNDCP (1999b). *Global illicit drug trends, 1999*. New York

Urberg, K.A. (1992). Locus of Peer Influence: social crowd and best friend. *Journal of Youth and Adolescence*, 21 (4), 439-450.

Urberg, K.A., Shyu, S.J. & Liang, J. (1990). Peer influence in adolescent cigarette smoking. *Addictive Behaviors*, 115, 247-255.

Van Meter, K.M. (1990). Methodological and design issues: techniques for assessing the representatives of snowball samples, in Lambert, E.Y. (Ed). *The collection and Interpretation of Data from Hidden Populations,* p.31-33 (Rockville MD, National Institute on Drug Abuse).

Vartiainan, E., Pallonen, U., McAlister, A., & Puska, P. (1990). Eight-year follow-up results of an adolescent smoking prevention program: The North Karelia Youth Project. *American Journal of Public Health*, 80, 78-79.

Wallace, J.M & Bachman, J.G. (1991). Explaining racial/ethnic differences in adolescent drug use: The impact of background and lifestyle. *Social Problems*, 38, 333-357.

Warshaw & Davis (1985). Disentangling behavioural intention and behavioural expectation. *Journal of Experimental Social Psychology*, 21, 213-228.

Webb, E., Ashton, C. H., Kelly, P, & Kamali, F. (1998). An update on British medical students' lifestyles. *Medical Education*. 32(3), 325-331.

Weinberger, D.A., & Bartholomew, K. (1996). Social-Emotional Adjustment and Patterns of Alcohol Use among Young Adults. *Journal of Personality*, 64 (2), 495-527.

Weinstein, R.M. (1976). The Imputation of Motives for Marijuana Behavior. *International Journal of the Addictions*, 11 (4), 571-595.

Wells, E.A., Hawkins, J. D., & Catalano, R. F. (1988). Choosing drug use measures for treatment outcome studies: II. Timing baseline and follow-up measurement. *International Journal of the Addictions*. 23(8), 875-885.

Werch, C.E., Lundstrum, R.H., Moore, A. (1989). Bogus-pipeline effects on self-reported college student drug use, problems and attitudes. *International Journal of the Addictions*, 24(10), 1003-1010.

Werner, MJ., Walker, L.S., & Greene, J.W. (1993). Alcohol expectancies, problem drinking, and adverse health consequences. *Journal of Adolescent Health*. 14(6), 446-452.

Whelan, S. & Culver, J. (1997). *'Don't say "no", say DARE? Summary of an outcome evaluation of a Drug Abuse Resistance Education programme in Mansfield, Nottinghamshire.* North Nottinghamshire Health Promotion.

White, D & Pitts, M. (1998). Educating young people about drugs: a systematic review. *Addiction*, 93(10), 1475-1487.

Wibberley, C. (1997). Young People's Feelings About Drugs. *Drugs: Education, Prevention and Policy*, 4(1), 65-78.

Williams, A., & Clark, D. (1998). Alcohol consumption in university students: the role of reasons for drinking, coping strategies, expectancies and personality traits. *Addictive Behaviors*, 23(3), 371-378.

Willner, P. (2000). Further validation and development of a screening instrument for the assessment of substance misuse in adolescents. *Addiction*, 95(11), 1691-1698.

Windle, M., Barnes, G.M. (1988). Similarities and differences in correlates of alcohol consumption and problem behaviours among male and female adolescents. *International Journal of the Addictions*, 23(7), 707-728.

Wolff, K., Farrell, M., Marsden, J., Monteiro, M.G., Ali, R., Welch, S., & Strang, J. (1999). A review of biological indicators of illicit drug use, practical considerations and clinical usefulness. *Addiction*, 94 (9), 1279-1298.

Wood, M.D., Nagoshi, C.T., Dennis, D.A. (1992). Alcohol norms and expectations as predictors of alcohol use and problems in a college student sample. *American Journal of Drug and Alcohol Abuse*, 18(4), 461-476.

World Health Organisation, (1992). *International Statistical Classification of Diseases and related health problems, (10th ed.),* Geneva: WHO.

World Health Organisation, (1994). *Lexicon of Alcohol and Drug Terms*. Geneva: WHO.

World Health Organisation, (1997) *Amphetamine-type stimulants: a report from the WHO meeting on Amphetamines, MDMA and other psychostimulants*. Geneva, 12-15 November 1996. Programme on Substance Abuse, Division of Mental Health and prevention of Substance Abuse, World Health Organisation, Geneva.

Wright, J.D., & Pearl, L. (1986). Knowledge and experience of young people regarding drug abuse, 1969-84. *British Medical Journal*, 292, 179-182.

Wright, J.D., & Pearl, L. (1990). Knowledge and experience of young people regarding drug abuse, 1969-89. *British Medical Journal*, 300, 99-103.

Young, R.M., Knight, R.G., & Oei, T.P. (1990) The stability of alcohol-related expectancies in social drinking situations. *Australian Journal of Psychology*. 42(3), 321-330.

Young, L., & Jones, R. (1996). *Young People and Drugs: Knowledge, Experience, Values*. SHADO, Liverpool.

Xie, X., Rehm, J., Single, E., & Robson, L. (1996). *The economic costs of alcohol, tobacco and illicit drug abuse in Ontario: 1992.* (Research Document No. 127). Toronto: Addiction Research Foundation.

Appendix A

Table A1 Summary of Dependence Criteria from ICD-10 and DSM-IV

Under ICD, dependence for a specific substance is diagnosed if three or more of the following criteria are seen (e.g. in the past 12 months):

Psychoactive dependence criteria in ICD-10

1. A strong desire or compulsion to use
2. Difficulty in controlling use

3a. Experience of a physiological withdrawal state; or

b. Use of same or similar substance to relieve or avoid withdrawal symptoms; or consumption of increased doses to achieve desired effects

5a. Progressive neglect of alternative pleasures or interests; or

b. Increased amounts of time taken to obtain, use or recover from substance effects.

6. Continued use despite evidence of harmful consequences.

Source: adapted from World Health Organisation 1992.

DSM-IV diagnoses dependence for a specific substance if three or more of the following criteria are seen (e.g. in the past 12 months):

Psychoactive dependence criteria in DSM-IV

1a. Need to use increased amount to achieve desired effect; or

b. Experience of lowered effect from continued use.

2a. Feeling sick or unwell when drug effects have worn off; or

b. Use of substance or similar to relieve of avoid withdrawal symptoms

3. Use in larger amounts or for a longer time than intended.
4. A persistent desire to use or problems trying to control or cutting down use
5. Large amounts of time spent either getting or using or recovering from effects
6. Use leading to quitting, reducing, or having problems in domestic, occupational, educational or social roles.

Source: adapted from American Psychiatric Association, 1994

DSM-IV diagnoses abuse for a specific substance if one or more of the following criteria are seen (e.g. in the past 12 months):

Psychoactive abuse criteria in DSM-IV

1. Use leading to neglect of personal, social, occupational roles
2. Use in an unsafe or dangerous situation.
3. Use leading to repeated problems with the law
4. Continued use despite of relationship, domestic, occupation or educational problems

Source: adapted from American Psychiatric Association, 1994

Appendix B Pre-interview questionnaire for Study One

PRE-INTERVIEW QUESTIONNAIRE		ID number:
Date:	Time:	Location:

1. Gender: Male Female	2. Age:

3. How would you describe your ethnic group?

4. What is your current occupation?

5. In a typical week, roughly how much do you have to spend on yourself after you have paid for accommodation, bills etc.?

£.....

Substance use profile	Cigarettes	Alcohol	Cannabis	Amphetamines	LSD	Ecstasy
6. Ever used?	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
7. Age at first use?						
8. Total times used? (card A)						
9. Used in the last year?	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
10. Used in past 3 months?	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
11. Days used in past 3 months (card B)						
12. Typical amount used? (record verbatim)						

CARD B	
Every day	90
6 days a week	77
5 days a week	64
4 days a week	51
3 days a week	39
2 days a week	26
1 day a week	13
3 days a month	9
2 days a month	6
Five days	5
Four days	4
Three days	3
Two days	2
One day	1

INFORMATION SHEET:

This study is about young people and drug and alcohol use.

You are eligible to participate if you are 16-22 years old.

The interview will last up to an hour and we will give everyone who takes part in the study a book or record token for their time. We would like to tape-record the interview so that we can make notes about it afterwards. Tapes will NOT have your name written on them and will be destroyed after the research study is finished. Nobody will be able to listen to the tape except for the research staff.

The questions in the interview will be about your lifestyle, your friends, what sorts of things you know about drugs and alcohol, and what drugs you have used. I will also ask you questions about what sorts of things influence you to use or not use drugs and alcohol.

Anything that you say will be kept completely confidential; your name isn't written on the questionnaire or the tape and so no one will be able to identify you from it.

If you have any questions about the study, please call Annabel Boys on:

Appendix E

Drugs: education, prevention and policy, Vol. 6, No. 3, 1999

What Influences Young People's Use of Drugs? A qualitative study of decision-making

ANNABEL BOYS,* JOHN MARSDEN, JANE FOUNTAIN, PAUL GRIFFITHS, GARRY STILLWELL & JOHN STRANG

National Addiction Centre, London, UK

ABSTRACT *Recent surveys in the UK indicate that approximately half of all young people aged 16–22 have used an illegal drug. Despite such observations, remarkably little research has been conducted in the UK about the motivating factors which shape the decisions that young people make to use drugs or alcohol. This paper reports on a qualitative study exploring the range of factors which young people reported to be influential over such decisions. Results are presented from in-depth interviews conducted with 50 16–21-year-olds. Analysis of the data revealed individual-level influences (the perceived functions of drug use (or specific purpose for using a particular substance), drug-related expectancies, physical/psychological state, commitments and boundaries) and social/contextual-level influences (environment, availability, finance, friends/peers and media) on decision-making. Of these, the perceived function for using a particular substance was identified as particularly influential. The findings are related to existing drug prevention approaches and opportunities for their further development are discussed.*

Introduction

In the UK, surveys suggest that the number of young people who have tried illegal drugs has increased during the past decade. The 1996 British Crime Survey reported that 35% of 16–19-year-olds had ever used cannabis, as had 42% of young people aged between 20 and 24 years (Ramsay & Spiller, 1997). Use of the so-called 'dance drugs' was also prevalent, with amphetamine use reported by 16% of 16–19-year-olds and 21% of 20–24-year-olds; followed by LSD (used by 10% and 14%, respectively) and then ecstasy (9% and 13%). In 1995, a Health Education Authority (HEA) survey in England reported similar findings and concluded that over half of all 16–22-year-olds have tried an illicit drug (HEA, 1997). The survey also points to an increase in the number of young people who have been offered drugs (Aldridge *et al.*, 1995; Balding, 1996; HEA, 1997). This suggests that although the number of people experimenting with illicit drugs has risen, for various reasons a significant number of young people have also decided to resist use.

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Numerous etiological theories of substance use amongst young people have been advanced (see Lettieri *et al.*, 1980, for discussion). The influence of the environment or 'setting' where substance use takes place on behaviour has also been recognized (Zinberg, 1984). In general, early work regarded individuals as essentially passive and influenced by social and environmental circumstances (e.g. Elliott *et al.*, 1989, 1985) while more recent perspectives have focused on active decision-making in which an individual considers the costs and benefits of taking a substance (e.g. Ajzen, 1985, 1988; Langer & Warheit, 1992).

Much of the work in this area has tended to focus on the decision to initiate into use of a given substance. However, although this decision is an important one, once initiation has occurred, an individual's decisions about substance use do not cease. Decisions are made about whether to use the substance on subsequent occasions and if so, how much to consume. Glasner & Loughlin (1987) observed that there were certain occasions when almost all of the young people in their study (including the heaviest users) decided against using drugs. They suggested that users had fairly rigid rules governing their drug-taking behaviour and established certain boundaries that they would not cross. The majority of their sample regarded their substance use as reflecting self-controlled choices.

There is evidence that young people's beliefs or expectancies about the effects of alcohol predict future drinking patterns (Christiansen *et al.*, 1989). However, little is known about the effects of other substance-use expectancies. It seems that expectancies concerning the effects of specific drugs are not necessarily solely based on their pharmacological effects, but are heavily influenced by reports from peers and socio-cultural factors (Stacy *et al.*, 1994). Studies have also explored the reasons and motivations cited by substance users for their behaviour. In some reports, these reasons vary from quite broad statements (e.g. to feel better) to more specific roles or *functions* for use (e.g. to increase self-confidence). However, much of this literature focuses on 'drugs' as a generic concept and makes few distinctions between different types of illicit substances (e.g. Butler *et al.*, 1981; Carman, 1979; Cato, 1992; McKay *et al.*, 1992; Newcomb *et al.*, 1988).

A considerable range of approaches and methods have been employed by drug education and prevention programmes. Some recent efforts have focused on the role of peers, the family, and attitudes and values held by an individual. These programmes have attempted to train young people to resist tempting forces such as 'peer pressure'. Others have used peer-educators to deliver drug prevention messages on the assumption that such messengers are more credible to a young population and are more likely to succeed. An alternative approach has been to encourage diversionary activities as alternatives to drug use. A central premise of this work is that young people use drugs because they lack access to other satisfying activities or because they are bored (Coggans & Watson, 1995). Thus it is hoped that providing young people with attractive alternatives to drug use with which to fill their leisure time will reduce motivations to use drugs.

There has been little qualitative study of the processes involved in substance-related decision-making. The identification of influential factors and exploration of their relative importance, could help to develop and inform new approaches to prevention and education. The primary objective of this paper is to describe the critical influences on substance-related decision-making amongst a sample of young users.

Method

Fifty young people (24 male, 26 female) were interviewed. Their average age was 18.5 years (range 16–21). All participants were recruited from the south of England using snowballing techniques with seven starting points with the aim of obtaining a range of ages, occupations (and thus incomes) and social backgrounds. The starting points included: a charity for homeless young people, a Further Education College, a youth club, a student nurse, a Higher Education College and a drug dealer. Given the aims of the study, a purposive sampling procedure was employed to recruit a diverse range of young people whose experience of substance use was in excess of national norms for this age range. Consequently, selection was not intended to provide a representative sample of young people from this age group. For more detail on the methods used, see Boys *et al.*, 1999.

A brief, structured interviewer-administered questionnaire was used to record demographic characteristics and lifetime use and recent consumption patterns of five target substances: alcohol, cannabis, amphetamines, LSD and ecstasy use, based on procedures developed by Marsden *et al.* (in press). A semi-structured interview was then employed to discuss the following topics: drug use of friends, personal drug use experience, decision-making and reasons for not using drugs. Respondents were encouraged to give as much information as they wanted to in response to questions. Interviews were tape-recorded with the interviewee's consent, and subsequently transcribed. A synthesis of analytic induction and grounded theory (Glaser & Strauss, 1967) was used to guide the analysis of the qualitative data.

Results

Sample Characteristics

The majority of respondents ($n = 36$; 72%) described their ethnic origin as 'white'; nine (18%) as African-Caribbean or Black British; three (6%) as mixed race and two (4%) as Asian. Half the sample reported that they were living with their parent(s). Nine were living in temporary hostels or on the street and the remainder were currently living in rented accommodation. Twenty-seven respondents were in some form of education; 13 had full-time work and the remaining 10 were unemployed.

All reported having drunk alcohol with friends, and the majority of the sample had also smoked tobacco (96%) or used cannabis (94%). Seventy per cent of the sample had used amphetamines, 54% ecstasy (MDMA) and 42% LSD (see Table 1). Analyses of rates of lifetime use of these substances did not differ between male and female respondents (χ^2 values did not exceed 2.81 for any comparison, $p = 0.09$ or greater).

In the context of the qualitative interview, none of the respondents described dependent patterns of use of the five targets. No respondent reported using substances to relieve withdrawal symptoms or craving.

Respondents were asked to estimate their weekly discretionary disposable income. This was defined as money in excess of that which was needed to pay for accommodation and other living costs. Estimates of this income ranged from £14 to £420 with a mean of £75 (median = £50) per week. Spending priorities varied, though most respondents cited socializing, night-club entrance fees and also buying alcohol or drugs.

Table 1. Patterns of substance use ($n = 50$)

	Lifetime use (%)	Last 12 months (%)	Days used in past 90 days (%) (95% C I.)
Alcohol	98	98	39 (29.2–48 6)
Cigarettes	96	82	88 (79.2–97.0)
Cannabis	94	84	58 (46 7–68 6)
Amphetamines	70	54	15 (5.4–25.4)
Ecstasy	54	46	16 (7.7–25.2)
LSD	42	20	16 (2.6–29.6)
Cocaine powder	32	Not recorded	
Heroin	20	Not recorded	
Benzodiazepines	12	Not recorded	
Other opiates	10	Not recorded	
Crack cocaine	4	Not recorded	

Substance-use Decision-making

A thematic analysis of the interview transcripts yielded 10 factors which were cited as influential on substance-related decision-making. These were then classified into two broad influence domains: individual-level influences and social/contextual-level influences.

Individual-level Influences

Five individual-level influences were observed: the functions of substance use, substance-related expectancies, physical/psychological state, role commitments and boundaries.

Functions Respondents highlighted a range of specific roles or functions for their substance use. Twelve general functions were identified (Table 2). Many of these were associated with facilitating social events or gatherings at night-clubs, pubs or friends' houses. Other functions related to specific aspects of some users' lifestyles. Examples included using cannabis or amphetamines in association with work or study to facilitate concentration, relieve boredom or increase motivation. As three respondents described:

> When I'm on cannabis, I feel I make more conscious decisions because I can concentrate more ... I usually have it before I go to work [waitressing] and I enjoy work so much more if I am stoned [intoxicated]. (006: female aged 19)
>
> I was working at [a large department store] as a Saturday job while I was at college ... and I spent about £15 [a day] on speed [amphetamines] to keep me going—to make it more enjoyable because it [the job] bored the hell out of me. (008: male aged 21)
>
> When I was doing my A levels, I went through a stage of using it [amphetamines] every day and its just so good because you're on top of everything ... if someone comes up to you and says 'Right I want a 2500 word essay for tomorrow' and you're like 'yeah! Whatever!' and that's why I like it because I'm not an organised person anyway ... and certainly round exam time it is quite handy. (012: female aged 18)

Table 2. Functions reported for use of different substances

• Increase energy	• Relieve boredom
• Relax	• Relieve depressive thoughts
• Dance	• Suppress appetite/diet
• Get away from problems	• Increase motivation to get things done
• Help manage effects from other drugs	• Facilitate work
• Decrease inhibitions	• Increase confidence

Others reported that they used drugs or alcohol to help them to cope with negative moods. This was also particularly common amongst the few respondents who were experiencing social problems such as homelessness. The following view was from an 18-year-old female who had been sleeping rough for 9 months:

> If someone's upset me or I'm in a bad mood, then I'll beg up £10 and I'll go and get an amp [ampoule of methadone] ... but if I'm in quite a jolly mood, then I'll get cannabis. (038: female aged 18)

This young woman had found that using methadone was a more effective means of achieving a positive state of mind than using cannabis.

> An amp [ampoule of methadone] makes you gouch [opioid-induced drowsiness] and you forget about everything ... I mean cannabis can help because it makes you laugh and so you can sit there and think things are funny, but you know amps block everything out whereas on cannabis you can still think about it, still think 'ohh they really pissed me off' and then you get a bad buzz with cannabis whereas with amps you know what I mean, you just get the same buzz.
>
> (038: female aged 18)

Amongst respondents with established drug-using repertoires, different substances were often used for different functions. Several respondents described using alcohol when socializing in public (to relax and feel more confident), ecstasy or amphetamines when going to a night-club (to help them to stay awake all night and feel energetic), and cannabis to manage the effects of the 'come-down' (after-effects) from stimulants, to relax at home with friends or to induce sleep. We also found some evidence that a belief that a particular substance was better than another at fulfilling certain functions might lead to increased use of one and decreased use of another. For example, a 19-year-old female had

recently started drinking heavily with a new group of friends at weekends instead of using large quantities of ecstasy and amphetamines. This change in behaviour was prompted when she realized that the feelings of depression that she was noticing during the week could be related to her weekend use of stimulants. This led to the decision to pull away from her stimulant-using friends and spend more time with another group. However, she still reported the desire to use a substance to facilitate social interactions and had found that drinking alcohol helped to do this:

> **... Do you think your drinking has increased since you've stopped using ecstasy so much?**
> Yeah—probably because of the group of friends I'm with ... I've always been quite a heavy drinker, but now at weekends, instead of going out, taking drugs and drinking water, I go out and get drunk.
> (006: female aged 19)

Expectancies Expectancies about the effects of a drug appeared to be influential in decision-making. Respondents tended to report that they used drugs with stimulant properties when they were going out to a club or wanting to stay up all night, whereas other drugs such as cannabis were generally used for relaxation and to encourage sleep. For example, if someone wanted to use a drug to help them to stay awake late to write an essay (the function for the use) they would need to choose a substance which they believed would help them to stay awake, but would not impair concentration. The following excerpt from an interview with a 21-year-old male suggests that he had clear expectations concerning the effects of ecstasy before trying it for the first time:

> Well I did know what the effects were because a lot of my friends at the time were already into the rave scene ... I was into the rave scene, but I was just doing speed, just to keep me going and by the time I actually got round to using ecstasy, I'd already seen what ecstasy was doing—what it did to other people. (020: male aged 21)

How an individual rated their expectancies of a drug's effects was also important. If they had disliked an experience with a drug, then they were likely to expect a similar experience on the next occasion of use and were thus more likely to decide against subsequent use. This was illustrated in an interview with a 21-year-old male:

> I'd never take acid [LSD] again or any strong hallucinogen ... coz it just [expletive] my head up ... makes me paranoid, I lose myself completely in it—it completely takes control over me. (008: male aged 21)

There was also evidence to suggest that expectancies can become more sophisticated as experience or information about a drug increases. A hypothetical example of this could be that an initial expectation about cannabis might be 'cannabis makes me giggly'; as more experience is gathered from observations

of others, listening to stories or from increased personal use, this expectancy could be modified to take dosage into account: 'cannabis makes me giggly it I smoke a little and very dopey if I smoke a lot'. With the addition of another substance, such as alcohol, a further modification could be: 'cannabis makes me giggly if I smoke a little, dopey if I smoke a lot, but if I smoke cannabis after drinking alcohol, then I get sick'.

Physical/psychological state Another influence on the drug-related expectancies held by an individual is their current physical and/or psychological health state. There were reports that these influences played a crucial role in decisions to use substances on a particular occasion. Some mentioned that their physical state influenced the decisions that they made. For example, an individual might take into account how tired they were or if they were already experiencing effects from other substances when deciding whether or not to consume a drug.

Psychological state was also important. In the following extract a male respondent explained how his current mood might affect whether or not he decided to try a new substance:

> If I'm in a good mood, if I'm not feeling depressed, if I'm happy with the way I am for the minute and if I'm in a room full of friends that I'm close enough to to be able to say 'look I'm going to be sick is it alright if I go and puke in your bathroom?', you know I might.
> (013: male aged 21)

He went on to explain how these sorts of factors influenced the drug and alcohol-related choices that he made on a regular basis. This particular respondent had set rules and boundaries concerning substance use, which were intended to insulate him from the risk of developing drug-related problems.

> I never do drugs to cheer myself up—I will smoke cannabis to calm myself down, but if I'm feeling depressed then I will never do ecstasy ... I will never to speed or LSD or anything in order to cheer myself up, I'll only ever do it if I'm already happy.
> **Why won't you do it to cheer yourself up?**
> Because that's what I see as then becoming psychologically dependent on the drug because if you do it once, obviously next time it happens then you'll just go 'oh—I'll do it again', and then you'll do it again and again and again and that's how addiction would over-take me ... but if I make sure that I'm happy and relaxed and everything, before I take the drug then I know that its not the drug that's making me happy, its *me* that's making me happy and its just the drug that's making it better! And therefore I don't feel any dependence on the drug.
> (013: male aged 21)

One experienced LSD user believed that one's current psychological state would impact on the effects experienced from this drug:

> I always stop people from taking it [LSD] when I'm with them if they've got problems at that time, coz ... if you're dwelling on some-

thing that's depressing you, all the emotions that you've bottled up do come out on LSD. (009: male aged 20)

Role commitments Role commitments (e.g. work or college responsibilities) were cited by several interviewees as having a marked influence over the types and quantities of drugs or alcohol that they decided to consume on a specific occasion. This appeared to be particularly important in limiting the use of drugs perceived to be long-acting (e.g. ecstasy or LSD). Substances such as cannabis and alcohol were used routinely, but often in smaller quantities.

Well yeah Fridays and Saturdays pilling [taking ecstasy pills] but probably still smoke on Sundays as well as in the week ... I did smoke more in the week, but I've tried to cut down on that coz you don't get things done and ... you end missing lectures. (021: male aged 20)

The influence of role commitments appeared to differ between individuals and was often mediated by expectancies concerning the severity of after-effects and the relative importance of the commitment compared with substance use and socializing. If a respondent had commitments the next day, they might select a drug type that they did not expect to feel negative after-effects from. For example, one male reported that after taking amphetamines he often felt 'groggy' or depressed for the 2 or 3 days afterwards. However, he felt 'fine' after taking ecstasy, and felt 'great' on a morning following cocaine use. He explained how he would decide between different drug types during an evening out with friends:

Does how you feel afterwards affect how you decide what you are going to use?
Yeah, depending on if I have things to do the next day—if I do then I'd probably choose ecstasy, coz I can come down quite easily on that ... if I could afford coke then I'd have that. (020: male aged 21)

Boundaries The majority of interviewees described fairly rigid rules which governed their substance use and there were certain boundaries which they reported that they would not cross. Respondents with similar drug-related experiences seemed to share the same basic rules. Heroin, crack and any injecting drug use was perceived by most of the sample as different from (and more dangerous than) other forms of drug use. Some bracketed cocaine powder with these substances, whereas other, more experienced drug users perceived cocaine as similar to ecstasy and amphetamines.

Do your friends use cocaine?
No—a lot of them would like to, but you don't get much coke in [name of county]!
What about crack?
No I don't think anybody would ... well ... probably the odd person

who takes heroin would do crack, but all the other people wouldn't ... because as far as me and 99.9% of my friends are concerned, you get so far and then there's a line and then across that line is heroin and crack and stuff—the things that you just don't do because they're too strong for people to handle and shouldn't be touched. (013: male aged 21)
... it seems OK to take Es and speed and things but wrong to take heroin—I think that's [the opinion of] my social circle.
(014: female aged 20)

Social/Contextual-level Influences

Five social/contextual-level influences were identified: environment, availability, finance, friends/peers and media.

Environment It was common to talk about needing to be in the 'right sort of place' when using certain drugs, particularly those with hallucinogenic effects. Some individuals reported that they had decided against trying a substance for the first time because their immediate environment had seemed unsuitable. There were clear trends in the types of environment or context that respondents felt were suitable for different types of substance use. For example, although using LSD in a club environment was not unknown, most users reported preferring to use it under less crowded, more predictable circumstances. This seemed to be due to concerns that users might experience anxious or paranoid-type ideation or otherwise get themselves into trouble.

I would never want to be in a club [when under the influence of LSD] because of the paranoid side of it, I'd rather be round a friends house and all of us take it, I would not like to take it on my own, I'd want everyone to be using the same drug and experiencing the same kind of thing as I would ... I'd rather be in someone's house or sitting in a field lying down or watching the world go by. (015: male aged 18)

Some also mentioned that whilst under the influence of LSD, they would prefer to avoid contact with people who had been drinking heavily.

If we're going to get off our heads [under the influence of LSD] it's a whole lot safer doing it out of the city, then you're not likely to walk into some of the [idiots] you get round here who go out looking for trouble, so we prefer to avoid that or go to people's houses ... especially if we're gonna take something like LSD—you don't know what you're doing, especially if you come across someone who's been drinking and is really [aggressive]. (009: male aged 20)

For most, the use of ecstasy was firmly linked with going to night-clubs. However, there were strong opinions as to what type of night-club was suitable

for this and similar sentiments to those described by LSD users were expressed concerning interactions with people who had been drinking heavily.

Availability A profoundly obvious influence on a decision to use a substance is whether it is available. However, the relative ease with which a substance can be obtained (i.e. how much it costs the individual in time and effort) mediates this decision. An important finding was that if a preferred drug was unavailable, participants reported they did not necessarily decide against any form of substance use on that particular occasion. Instead, a decision was often taken to use a substitute substance. Examples of this included substituting amphetamines for ecstasy (or *vice versa*) or caffeine pills for amphetamines.

> I only use speed [amphetamines] in like dire emergencies when I like really feel like doing some drugs and there's nothing around ...
> (017: female aged 18)

> **Have you ever used Pro-plus [an over-the-counter caffeine-based tablet]?**
> When we were on holiday then we used it ... with drink, because we couldn't get anything out there and—just like in place of speed [amphetamines]. (017: female aged 18)

There were also some reports that a lack of availability of a preferred drug had prompted initiation into the use of another, often 'harder' drug type.

> The first time I took speed [amphetamines], I was about 16, was when I couldn't get any cannabis ... we didn't want to get pissed because you really do get bored of drinking all the time and we wanted to have a good time, couldn't get any cannabis while we were in the pub (we asked why and they said that everyone had been busted—the police had basically done all the dealers—stopped all the supply and so it had gone dry), so we were offered some speed and we took it ... same with ecstasy, first time I took ecstasy was coz there was no cannabis on the market. (009: male aged 20)

In such cases it seems that the respondents were motivated to obtain a specific drug for a specific purpose. The discovery that their drug of choice was unavailable gave them the incentive to find an alternative means of fulfilling that function. On occasions this resulted in the use of an alternative substance that they might not have considered using otherwise.

Finances Money was frequently cited as a important influence on decision-making, particularly when deciding whether to use a substance on an occasion and which type to obtain. For example, some respondents who commonly used ecstasy at night-clubs reported that if their money was limited, they might choose to use amphetamines instead. Alternatively, if money was more readily available, cocaine might be selected. However, financial constraints did not seem to influence the use of cannabis in the same way, particularly amongst the more regular users. Instead, some reported that they sold small quantities of cannabis

to friends in order to earn their own supply for free. In times of limited finance, they could therefore manage without moderating their use.

> **Do you always have enough money for cannabis?**
> Well sort of—I've sold a bit here and there when I've been totally skint [lacking money], to get by ...
> **If you're totally skint, then you'll sell a bit, but otherwise you don't?**
> No ... it's not worth the risk really ... I certainly wouldn't do it here [London], but in [county] its perfectly acceptable that if you're a bit skint you can sell a bit ... and no-one really worries about it.
> (012: female aged 18)

In contrast to this, consumption of other illicit drugs tended to be reduced when money was limited. There were frequent statements that finances limited use of drugs such as ecstasy and cocaine but there were no reports of dealing these drugs in order to continue using when money was limited.

Friends/peers Many respondents socialized with more than one group of friends. Although close friends were often reported to have similar substance-using patterns to their own, it was not uncommon for friends from different social circles to have very different patterns of use. Some respondents differentiated between circles of friends according to their substance use, referring to non-drug users as their 'straight friends'. A few reported that they would tailor their own substance use to fit within the group norms of those they were socializing with on a particular occasion.

The data suggest that friends were definitely associated with the opportunity to use drugs. However, although the concept of 'peer pressure' was often mentioned by interviewees, the prevailing opinion seemed to be that drug use was engaged in through choice rather than as a result of social pressures. This could be likened to other situations where if someone has enjoyed an experience they might be motivated to encourage their friends to share the experience. However, a variety of other social and contextual factors were also described by respondents as having an influence over their substance-related choices suggesting that the process is complex and multifaceted.

There was also evidence that friends provided moral support to users as the following extract shows:

> I don't like to do things on my own ... I like to have at least one person on my wavelength—otherwise I might get paranoid.... If I go out with someone its normally a close friend—I want to go out with someone who I trust in case something does go wrong ... you know if I had a bad reaction to anything or ... So it always has to be someone who I trust completely and who would know what to do if something does happen ... and the person that I go out with I won't leave ... I'll stay with them all night. (011: female aged 19)

Media Some respondents cited media coverage as being influential over their decision-making. In most cases, this concerned ecstasy use. In these instances,

news stories of ecstasy-related deaths had led these young people to the conclusion that the possible benefits of using were not worth the risk of negative effects. However, other respondents dismissed these accounts completely, or offered explanations which cast the victims as incompetent drug users. Some had constructed rules for themselves which they believed would keep them safe when using ecstasy:

> People are weird about the dangers of it (ecstasy) coz of all the hype you get in the media ... but that really is dogma—if you use ecstasy, you find out that it really isn't as dangerous as they say in the media and the dangers can be reduced by watching your temperature, drinking—not drinking too much ... the right amount—and by taking salt and isotonic drinks and avoiding hot and cramped conditions like you get in clubs. (021: male age 20)

In contrast, the lack of high-profile media stories relating to amphetamines seemed to have prompted many to deduce that this drug was far less dangerous than ecstasy. Consequently these individuals were motivated to use this drug instead.

Discussion

This paper presents a qualitative study of substance-related decision-making amongst young people aged 16–21. A purposive sampling procedure was used to recruit individuals whose experience of substance use was in excess of national norms for this age range.

A thematic analysis of the data yielded 10 factors which were seen to influence the decisions made by the sample. These factors were classified into five individual-level influences (the functions of drug use, drug-related expectancies, physical/psychological state, commitments and boundaries) and five social/contextual-level influences (environment, availability, finance, friends/peers and media). A focus on any one of these factors could provide an opportunity for prevention measures to influence the decisions made by young people. Furthermore, addressing several of these factors at once, might considerably strengthen the effectiveness of such prevention programmes, by tackling the issue from several stances.

To date, measures to reduce the overall availability of illicit substances have been the cornerstone of national and international drug policy. This continues to be a key aim in the revised UK drug strategy (Tackling Drugs to Build a Better Britain, 1998). However, it is recognized that supply reduction is unlikely to be successful in isolation. Indeed, there is evidence from the present study that if a preferred substance is unavailable an individual may choose to use an alternative substance instead. It is unclear what overall public health benefits are likely to accrue from such selective substitution of one substance for another.

Approaches to drug prevention from a health education perspective have generally targeted two factors: the influence of peers and substance-related expectancies. For the former, programmes have tried to equip young people with the skills to resist 'peer pressure' to use drugs; for the latter, mass-media campaigns have been employed to communicate the potential negative effects

of substance use. However, the evidence that media campaigns are effective is limited, particularly if the target audience already has personal experience of substance use and has conflicting positive expectancies concerning a drug's effects. Although some of our respondents cited general mass media as a major influence over their decision-making, these views tended to focus on coverage of ecstasy-related deaths. In contrast, many respondents had either dismissed these accounts completely, or offered explanations which cast the victims as incompetent drug users.

The importance of recognizing the functions, or the specific purpose which substance use serves, was highlighted in our data. A total of 12 different functions for substance use were identified. This list is unlikely to be comprehensive and further research is required to provide a more detailed understanding of this area. It may be that substance use fulfils a variety of functions for an individual which could be described in a hierarchy. For example, amphetamine use at a night-club could primarily help the user to stay awake all night and dance energetically. Secondary functions might include increased confidence or decreased inhibitions. Further exploration of these motivations could make a useful addition to models which aim to explain substance-use behaviour.

To date, much of the discussion around why some young people choose to use drugs while others do not has focused on the role of peers. There was evidence in the present study that friends and peers are important in providing opportunities for drug use and supporting this behaviour. However, their influence was perceived to be only one of a range of influences and reports of using drugs when alone were not uncommon. Emphasizing the functions of substance use may enable concepts such as 'peer pressure' or 'peer influence' to be acknowledged without regarding them as the sole explanation for all forms of substance use. On the one hand, people who seem influenced by peer drug use could be described as using drugs with the function of helping them to feel part of a social group. On the other hand, reports of the solitary use of amphetamines by a young sales assistant who worked long hours could be explained primarily in terms of the functions this drug served to help him/her feel more energetic and less tired.

Besides helping to explain substance use, a functional perspective could also inform drug education programmes. Our results pointed to different functions served by using particular drugs and a different profile of functions across different substance types. For example, reported functions for amphetamine use ranged from relieving fatigue at work, dieting or staying awake, to motivating users to be organized. Most literature targeting young amphetamine users assumes that use is linked to socializing. Developing our understanding of the range of functions that drug use fulfils could inform prevention programmes targeting different contexts of use. There is also scope for developing prevention strategies which encourage recognition of the functions that substance use plays for some young people and which promote alternative means for fulfilling these roles. For example, people who use cannabis to induce sleep or alcohol to relax them in social situations could be shown alternative methods for achieving these goals. This approach could be perceived as similar to diversionary programmes in that alternatives to substance use might be offered. However, to date, the evidence for the success of such programmes is weak (Cook *et al.*, 1984; Kim, 1981; Moskowitz *et al.*, 1983, 1984; Stein *et al.*, 1984). One reason for this could be that the functions that substance use serves for participants have not been

targeted. Instead programmes have hinged on the assumption that use stems from boredom and if young people are encouraged to fill their time with alternative activities, this will alleviate the need to spend time engaged in drug or alcohol use. Whilst offering young people exciting leisure pursuits may be valuable, it is perhaps unreasonable to expect this to prevent substance use unless the gains from participation are similar to those perceived from using substances. The challenge is to find alternatives which fulfil the same functions as drug or alcohol use and are equally attractive to young people.

In addition, it may be unhelpful for education programmes to make a division between alcohol and illicit drugs when their use is clearly linked for many individuals. Prevention programmes that aim to deter all illicit substance use overlook the possibility that someone who has been using drugs heavily could substitute a licit alternative in comparable quantities thus exposing themselves to similar (or even greater) health risks.

Overall, this study has identified a complex set of factors which influenced the substance-related decisions made by this small sample group of young people. Our results suggest that prevention strategies that do not take into account these complex processes or merely target one influence on decision-making are likely to be at best ineffectual and at worst counterproductive. Further research using quantitative methods is likely to be valuable in determining the relative importance of these factors for different groups of people using different types of substances. Additionally, further work could examine variation according to frequency and quantity of use, in the decision-making processes used.

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References

ALDRIDGE, J., PARKER, H. & MEASHAM, F. (1995). *Drugs Pathways in the 1990s· adolescents' decision-making about illicit drug use.* Manchester: SPARC, Department of Social Policy and Social Work, University of Manchester.

AZJEN, I. (1985). From decisions to actions: a theory of planned behaviour. In J. KUHL & J. BECKMANN (Eds), *Action-control: from cognition to behaviour* (pp. 11–39). New York: Springer.

AZJEN, I. (1988). *Attitudes, Personality and Behaviour.* Homewook, IL: Dorsey Press.

BALDING, J. (1996). *Young People and Illegal Drugs in 1996* Exeter: Schools Health Education Unit, University of Exeter.

BOYS, A , FOUNTAIN, J , MARSDEN, J., GRIFFITHS, P , STILLWELL, G. & STRANG, J. (1999). *Drugs decisions: a qualitative study of young people, drugs and alcohol.* Health Education Authority, London.

BUTLER, M C., GUNDERSON, E K E. & BRUNI, J R. (1981). Motivational determinants of illicit drug use: an assessment of underlying dimensions and their relationship to behaviour. *International Journal of the Addictions,* 16, pp. 243–52.

CARMAN, R.S. (1979). Motivations for drug use and problematic outcomes among rural junior high school students. *Addictive Behaviours,* 4, pp. 91–93.

CATO, B M. (1992). Youth's recreation and drug sensations: is there a relationship? *Journal of Drug Education,* 22, pp. 293–301.

CHRISTIANSEN, B A., SMITH, G.T., ROEHLING, P.V. & GOLDMAN, M S. (1989). Using alcohol expectancies to predict adolescent drinking behaviour after one year. *Journal of Consulting and Clinical Psychology,* 57, pp. 93–99.

COGGANS, N. & WATSON, J. (1995). Drugs education: approaches, effectiveness and delivery. *Drugs: education, prevention and policy,* 2, pp. 211–224.

COOK, R., LAWRENCE, H , MORSE, C. & ROEHL, J. (1984). An evaluation of the alternatives approach to drug abuse prevention. *International Journal of the Addictions,* 19, pp. 767–87.

ELLIOTT, D S., HUIZINGA, D. & AGETON, S S. (1985). *Explaining Delinquency and Drug Use.* Beverly Hills, CA: Sage.

ELLIOTT, D S , HUIZINGA, D. & MENARD, S. (1989). *Multiple Problem Youth. delinquency, substance use and mental health problems.* New York: Springer-Verlag.

GLASER, B.G. & STRAUSS, A L. (1967). *The Discovery of Grounded Theory strategies for qualitative research.* New York: Aldine.

GLASNER, B. & LOUGHLIN, J. (1987). *Drugs in Adolescent Worlds: burnouts to straights.* London: Macmillan.

HEALTH EDUCATION AUTHORITY/BMRB INTERNATIONAL (1997). *Drug Use in England: results of the 1995 National Drugs Campaign survey.* London: HEA.

KIM, S. (1981). An evaluation of ombudsman primary prevention program on student drug abuse. *Journal of Drug Education,* 11, pp. 27–35.

LANGER, L.M. & WARHEIT, G J. (1992). The pre-adult health decision-making model: linking decision-making directednessorientation to adolescent health related attitudes and behaviours. *Adolescence,* 27, pp. 919–48.

LETTIERI, D J., SAYER, M. & PEARSON, J.W. (1980) Theories on drug abuse: selected contemporary perspectives. *NIDA Research Monograph 30.* Washington, DC: US Government Printing Office.

MARSDEN, J , GOSSOP, M , STEWART, D , BEST, D , FARRELL, M., EDWARDS, C., LEHMANN, P. & STRANG, J. The Maudsley Addiction Profile (MAP): a brief instrument for assessing treatment outcome (in press).

MCKAY, J R., MURPHY, R.T., MCGUIRE, J., RIVINUS, T.R. & MAISTO, S A. (1992). Incarcerated adolescents' attributions for drug and alcohol use. *Addictive Behaviours,* 17, pp. 227–35.

MOSKOWITZ, J., MALVIN, J., SCHAEFFER, G. & SCHAPPS, E. (1983). Evaluation of a junior high school prevention program. *Addictive Behaviours,* 8, pp. 393–401.

MOSKOWITZ, J., MALVIN, J , SCHAEFFER, G. & SCHAPPS, E. (1984). An experimental evaluation of a drug education course. *Journal of Drug Education,* 14, pp. 9–22.

NEWCOMB, M D., CHOU, C.-P , BENTLER, P M. & HUBA, G.J. (1988). Cognitive motivations for drug use among adolescents. longitudinal tests of gender differences and predictors of change in drug use. *Journal of Counselling Psychology,* 35, pp. 426–38.

RAMSAY, M. & SPILLER, J. (1997). *Drug Use Declared in 1996. latest results from the British Crime Survey.* London: Home Office.

STACY, A.W , LEIGH, B C. & WEINGARDT, K. (1994). Memory accessibility and association of alcohol use and its positive outcomes. *Experimental and Clinical Psychopharmacology,* 2, pp. 269–282.

STEIN, J S., SWISHER, J.D , HU, T. & MCDONALD, N S. (1984) Cost effectiveness evaluation of a channel one program. *Journal of Drug Education,* 14, pp. 251–69.

TACKLING DRUGS TO BUILD A BETTER BRITAIN (1998) *The Government's 10-year Strategy for Tackling Drug Misuse.* (1998) London: The Stationary Office.

ZINBERG, N E. (1984). *Drug, Set and Setting: the basis for controlled intoxicant use.* Yale University Press.

Appendix F Information sheet for Study Two

INFORMATION SHEET:

This study is about young people and drug and alcohol use.

You are eligible to participate if you are 16-22 years old.

The interview will last about quarter of an hour and we will ive everyone who takes part in the study £5 for their time.

The Questionnaire asks about your alcohol and drug use. There are also some questions about the your friends and lifestyle. Anything that you say will be kept completely <u>confidential</u>. No-one else will see your questionnaire, and your name isn't written down anywhere.

If you have any questions about the study, please call Annabel Boys on:

Appendix G Written consent form for Study Two.

Title of study: Young people, drugs and alcohol

Name of Researcher: _____

Please initial box

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. ☐

3. I agree to take part in the above study. ☐

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Researcher	Date	Signature

Identification Number:

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RESEARCH REPORT

Substance use among young people: the relationship between perceived functions and intentions

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Abstract

Aims. *To explore the relationship between young people's use of psychoactive substances, perceived functions for using, the experience of negative effects, and the influences of these variables on their intention to use substances again.* **Design.** *Cross-sectional survey in which respondents were purposively recruited using snowballing techniques.* **Setting.** *Interviews were conducted in informal community settings.* **Participants.** *One hundred young drug and alcohol users (45 females) aged between 16 and 21 years.* **Measurements.** *Life-time prevalence, current frequency and intensity of substance use and intentions to use again were assessed for four target substances (alcohol, cannabis, amphetamines and ecstasy) together with measures of the perceived functions for their use and peer substance involvement.* **Findings.** *The life-time experience of negative effects from using the assessed substances was not found to correlate with current consumption patterns. Statistically significant associations were observed between the reported frequency of taking substances and the perceived social/contextual and/or mood altering functions cited for their consumption. The substance use function measures together with the reported extent of peer use were significant predictors of intentions to use again.* **Conclusions.** *If these findings are confirmed in larger studies, educational and preventative efforts may need to acknowledge the positive personal and social functions which different substances serve for young people. The results also call into question the extent to which the experience of negative effects influences future patterns of use.*

Introduction

This paper reports findings from a study of the personal and social influences on substance use among young people. There is widespread concern about this issue in many countries, including the United Kingdom (UK, Central Drugs Coordinating Unit, 1998), continental Europe (European Monitoring Centre for Drugs and Drug Addiction, 1997) and the United States (US, National Institute on Drug Abuse, 1997). In the UK, data from recent population surveys show that some 50% of young people between the ages of 16 and 24 years have used an illicit drug (Ramsay & Spiller, 1997; Health Education Authority, 1997). The life-time prevalence of cannabis use among 16–19-year-olds in Britain is estimated to be 35%, and use of the so-called 'dance drugs', ecstasy, amphetamines and LSD,

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is 6%, 10% and 10%, respectively. For 20–24-year-olds, life-time prevalence for cannabis rises to 42%, with 21% reporting use of amphetamines, 13% ecstasy and 14% LSD (Ramsay & Spiller 1997). In contrast, the prevalence of cocaine use stands at 2% for 16–19-year-olds and 6% for 20–24-year-olds. Use of heroin is reported by 1% or less of people aged 16–24 years. These data are generally comparable with estimates from other European countries (European Monitoring Centre for Drugs and Drug Addiction, 1997) and the US (Johnston, O'Malley & Bachman, 1997).

A concerted effort has been made to develop aetiological models of substance involvement among young people with some application to prevention and education programmes (see Lettieri, Sayer & Pearson, 1980; Petraitis, Flay & Miller, 1995, for discussions). One approach has viewed young people as essentially passive and vulnerable to influences in their social environment which may encourage substance use (e.g. Elliott, Huizinga & Ageton, 1985; Elliott, Huizinga & Menard, 1989). From this perspective friends (peers) are thought to exert pressure on a young person to conform to group norms and substance use preferences. Consequently, some prevention programmes have attempted to train young people in the skills needed to resist "peer pressure" (Bureau of Justice Assistance, 1988; Whelan & Culver, 1997). However, while research has consistently found a strong association between peers and individual behaviour, the nature and direction of this relationship has not been studied in detail and is somewhat controversial (Kandel, 1985; Coggans & McKellar, 1994; Bauman & Ennett, 1996). Another aetiological perspective has sought to identify factors which protect young people from or propel them towards using substances. For example, Epstein *et al.* (1995) proposed that good communication and assertiveness skills are protective factors which help an individual to decline an opportunity to take a substance in a social situation. In this study, links were found between individuals having high self-efficacy for life skills and a lower likelihood of experimentation with cannabis. A range of risk factors have also been suggested, including impaired emotional control (Jessor & Jessor, 1977), low achievement at school (Brook *et al.*, 1986) and family conflict (Robins, 1980).

A contrasting approach, broadly influenced by psychological theories of health behaviour decision-making (e.g. Langer & Warheit, 1992; Ajzen, 1985, 1988), sees young people as making an active appraisal of the personal benefits and costs from using substances. Here, research has tended to focus on alcohol, tobacco and, to a lesser extent, cannabis. Many studies have explored the reasons and motivations which young people cite for using a substance (Carman, 1979; Butler, Gunderson & Bruni, 1981; Newcomb *et al.*, 1988; Cato, 1992; McKay *et al.*, 1992). Some reports have described both personal reasons for use (e.g. because of negative mood) and social motives (e.g. to have a good time with friends) (Haden & Edmundson, 1991). Others have identified more detailed categories including: positive/negative affect, social/recreation, compulsive use, drug-effect, tension reduction and peer-influence (Segal, Huba & Singer, 1980; Segal *et al.*, 1982; Segal, 1985–86; Johnston & O'Malley, 1986; Newcomb *et al.*, 1988). A limitation of much of this work has been the grouping of all illicit substances together or a simple distinction between cannabis and an unspecified global category labelled "hard drugs". However, Johnston & O'Malley (1986) were able to differentiate between reasons for use of alcohol, cannabis, LSD, amphetamines, tranquilizers, cocaine and opioids in young Americans. Their findings suggested that these reasons vary across the type of substance and the extent of an individual's prior experience. Another study showed that the perceived physical and psychological effects of cannabis were more powerful predictors of continued use than the perceived social benefits (Bailey, Flewelling & Rachal, 1992).

The influence of negative effects from taking a substance (e.g. anxiety, hangover) on future consumption patterns has received little attention from research. Despite the emphasis placed by prevention programmes on highlighting negative experiences, there is little evidence that this helps to deter future use (Huba, Newcomb & Bentler, 1986).

In the UK to date, there has been only limited exploration of the relative importance of personal and social factors on substance use involvement and future intentions. Little practical information has been gathered to guide education programmes which distinguish between different types of substances. In consequence, we sought to conduct a focused, small-scale study of young people who have had some experience of using different substances. We considered that a focused study design would be an economical and efficient means of exploring these issues and for generating formal hypotheses for testing in a larger sample. The objective of the study was to explore relationships between individual and peer substance involvement, the reasons or perceived *functions* for using different substances, the experience of negative effects and future substance use intentions.

Method

Measures

Data were gathered from a researcher-administered interview of approximately 30 minutes' duration. Life-time use of tobacco, heroin, cocaine hydrochloride, crack cocaine and LSD was recorded. For alcohol, cannabis, amphetamines and ecstasy—the substances which are most commonly used in this population—the frequency (total number of days used) and typical quantity (intensity) of consumption on a using day in the 90 days prior to interview was assessed (see Marsden *et al.*, 1998). Prompt cards were used to assist recall for frequency of consumption while typical daily quantity was recorded verbatim. The reliable measurement of the intensity of illicit drug use from self-reports is acknowledged to be problematic and self-reports were taken to be a proxy for the true dosage. Respondents were asked to estimate the proportion of their friends who were likely to use each substance within the next 6 months (as a indicator of perceived peer drug involvement) using a five-point scale (none–all), and also the likelihood that they would themselves use in the next 12 months, using a seven-point scale (very unlikely–very likely).

We developed three scale measures for the interview. A three-item Mood Function scale assessed the frequency of using a named substance in the past year to: (a) "make yourself feel better when you were low or depressed"; (b) "to help you to relax"; and (c) "to help make an everyday activity less boring". A five-item Social/Contextual Function scale assessed the frequency of using named substances to: (a) "help you to feel more confident in a social situation"; (b) "help you to let go of inhibitions"; (c) "help you to keep going on a night out with friends"; (d) "enjoy the company of your friends"; and (e) "help you to feel closer to someone". A three-item life-time Negative Effects/events scale also assessed for each substance how often the respondents had ever "felt sick or unwell"; "taken more or a stronger dose than you would have liked to" and "wished the effects would reduce or stop". Responses to the three scales were recorded using a five-point scale (never–always). It should be noted that the function scales are measures of behaviour (i.e. the recalled frequency of using a substance) and are therefore distinct from expectancy scales which measure beliefs.

An initial pool of 10 items for the Mood Function scale and Social/contextual function scales was derived from the relevant literature and from qualitative interviews with a separate sample of 10 young people (aged 16–21 years), who had recently used two or more of the target substances. Two items were discarded after piloting. The pool of four items for the Negative Effects scale was developed in a similar manner, with one statement being discarded after piloting. Prior to data collection, the items were randomly ordered. Scale scores were subsequently computed by summing the responses for each item and dividing by the number of items.

Sampling and recruitment

One hundred respondents were recruited from Southern England using snowballing interview techniques with nine starting points. Interview starting points included a waitress, a university student, a drug seller and a college student. This recruitment technique is believed to be an effective way of generating samples from hidden population where no formal sampling frame is available (Van Meter, 1990). The sampling procedure was designed to recruit individuals whose experience of substance use was in excess of national norms for this age range. Sampling was not therefore intended to yield a representative group of young people in this age range. All interviews were conducted in informal community settings.

Results

The sample

One hundred young people were interviewed (45 females). Their average age was 18.8 years (range 16–21). The majority ($n = 74$) described themselves as "white European"; 17 reported

Table 1. *Frequency and intensity of substance use in the past 90 days (n = 100)*

Substance (users in past 90 days)	% days used in past 90 days (SD)	Average amount on using day (SD); range)
Alcohol ($n = 93$)	41.2 (31.7)	8.5[b] (4.7; 1–17)
Cannabis ($n = 67$)	55.5 (37.0)	4.5[a] (3.5; 1–14)[1]
Amphetamines ($n = 23$)	15 8 (22.3)	1.3[d] (0 8; 0.075–3.0)
Ecstasy ($n = 22$)	13 6 (17.2)	1.6[c] (0.8; 0.5–3.0)[2]

[a] = No. of "cannabis cigarettes"; [b] = no. of units (1 unit = 8 g ethanol approx.); [c] = no. of tablets, [d] = grams. [1]Two respondents reported smoking 25 and 30 cannabis joints, respectively, on a typical day when using. These outlying values were recoded to the next highest intensity recorded (14 cannabis joints). [2]One ecstasy user reported using six tablets on a typical using day. This outlying value was recoded to the next highest intensity recorded (three tablets/using day) to ensure a more representative measure of mean intensity.

Table 2. *Correlations between frequency and intensity of use and the functions and negative effects scales (n = 100)*

Substance (users in past 90 days)	Correlations between frequency of substance use (and intensity of use) and scale scores: Mood Function scale	Social/Contextual function scale	Negative Effects scale
Alcohol ($n = 93$)	0.52*** (0.40)***	0.34*** (0.50)***	0.08 (0 06)
Cannabis ($n = 67$)	0 44*** (0.27)*	0.30* (0.18)	− 0.02 (− 0.18)
Amphetamines ($n = 23$)	0.30 (0.20)	0.43* (0.28)	0 03 (0.29)
Ecstasy ($n = 22$)	0.42* (0.31)	0.20 (0 22)	0.19 (0 40)

* = $p < 0$ 05; *** = $p < 0.001$.

their ethnic origin to be "African-Caribbean" or "black British", six as "Asian" and three as "mixed race". Thirty-seven respondents lived with their parent(s); 21 were living in temporary hostels or were of no fixed address and 42 were in rented accommodation. Most of the sample ($n = 69$) were in some form of education at the time of interview; 16 had full-time work and 15 were formally unemployed.

A wide range of life-time substance use was reported. All respondents had used alcohol, 94 had smoked at least one cigarette and 89 reported using cannabis. For the other six substances assessed, life-time use was as follows: illicit amphetamines ($n = 56$), ecstasy ($n = 38$), LSD ($n = 35$), heroin ($n = 13$), illicit opioids ($n = 5$) and illicit benzodiazepines ($n = 6$). Six respondents reported intravenous drug use at some point in their lives and two were current injectors. None of the participants reported previous treatment for substance use. Life-time polysubstance use was common: the mean number of different substances ever used (excluding cigarettes) was 3.4 (range 1–8). There were no differences in life-time prevalence between males and females. The remaining analyses concern the four target substances (alcohol, cannabis, amphetamines and ecstasy) selected for detailed investigation.

Substance use patterns

Table 1 summarizes the frequency and typical intensity of consumption for the four target substances during the 90 days prior to interview. There were no observed differences in the frequency of substance use between males and females. Gender differences in the average intensity of use were observed for alcohol and cannabis only. Males reported smoking 5.6 cannabis joints on a typical day (range 1–14) and females reported smoking 2.5 cannabis joints (range 1–8) ($t_{[64]} = 3.87$, $p < 0.0001$). For alcohol, male drinkers consumed an average of 9.5 standard units on a typical using day (range 2–17 units) in contrast with females, who drank an average of 7.2 units (range 1–16 units) ($t_{[90]} = 2.42$, $p < 0.05$).

Pearson's product–moment correlation coefficients for the age of the respondent and the frequency of use of cigarettes, alcohol, cannabis and ecstasy in the past 90 days averaged 0.16 in absolute value across the four substances. Pairwise comparisons were non-significant ($p > 0.05$) with the exception of amphetamines ($r = 0.65$, $p < 0.001$). There were no statistically significant correlations between the age of the respondent and the intensity of use.

Functions, negative effects and use

Chronbach's alpha coefficients across the users of alcohol, cannabis, amphetamines and ecstasy averaged 0.72 for the Mood Function scale, 0.80 for the Social/Contextual function scale and 0.78 for the Negative Effects scale. Scores on the Mood Function and Social/Contextual function scales were significantly correlated for all four substance types (the average of the interscale correlations was 0.55; $p = 0.01$ or less). The Negative Effects scale was statistically independent from the two functions scales with the exception of alcohol, where the correlation between this and the Social/Contextual function scale was 0.22 ($p < 0.05$).

The scale scores were then correlated with the frequency and intensity of substance use in the past 90 days (Table 2). The average correlation for the Mood Function scale and frequency of use for the four substances was 0.42. Higher scores on this scale were associated with more frequent use of alcohol, cannabis and ecstasy in the 3 months prior to interview. With the exception of ecstasy, correlations for the Social/Contextual scale also suggested that there was a tendency for higher scores to be associated with more frequent use. For the typical intensity of use, correlations between the average number of units of alcohol consumed on a typical drinking occasion and both the Mood Function scale and Social/Contextual function scales were significant ($p < 0.001$ for both). The average intensity of cannabis smoking was also found to correlate significantly with the Mood Function scale ($p < 0.05$) but not with the Social/Contextual function scale.

Many respondents reported experiencing negative effects from their life-time consumption of the four substances. These were most commonly reported for alcohol. Mean scores on the Negative Effects scale (range 0–12) were as follows: alcohol = 6.1; cannabis = 2.9; ecstasy = 2.8; amphetamines = 2.8. In contrast to the function scales, correlations between frequency of recent use and the negative effects scale were low (averaging 0.08 in absolute magnitude) and were non-significant. Correlations between intensity of use and the negative effects scale were also low (averaging 0.23 in absolute magnitude, NS). Correlations between the measure of perceived current peer drug involvement and both the frequency and typical intensity of cannabis use were significant ($r = 0.36$; $p < 0.01$ and $r = 0.28$; $p < 0$ 05, respectively). The perceived extent of peer use of alcohol correlated with the frequency of use ($r = 0.30$; $p < 0.01$), but not the usual intensity of use ($r = 0.13$; NS). Correlations between perceived peer drug involvement and the frequency and intensity of ecstasy use ($r = 0.38$; NS; $r = 0.41$; NS) and amphetamine use ($r = 0.12$; NS; $r = 0.38$; NS) were also non-significant.

Future substance use intentions

We then sought to explore the relationships between the function scales, perceived peer involvement and the respondents' substance use intentions. Specifically, the ability of the Mood Function, Social/Contextual function and Negative Effects scales to predict the perceived likelihood of future use for each substance was assessed. Correlations between scores on the Negative Effects scale and the likelihood of using each substance were low (averaging 0.09 in absolute value) and were non-significant. This scale was therefore excluded from further analysis.

Separate standard multiple regressions analyses (in which all covariates were entered simultaneously) were performed. The perceived likelihood of using each substance in the next 12 months was the dependent variable and age, sex, the Mood Function and Social/Contextual function scores and the extent of peer involvement were covariates. The cases to covariates ratio for

Table 3. *Standard multiple regressions of personal demographics, perceived function scales and extent of peer use on future intentions to use alcohol, cannabis, amphetamines and ecstasy (n = 106)*

	Alcohol		Cannabis		Amphetamines		Ecstasy	
Covariates	r^1	β	r	β	r	β	r	β
Age	−0.13	0.006	−0.16	0.037	0 03	0 023	0.10	0.010
Sex[1]	−0.04	0.011	0.09	0.033	−0.25*	0.130	0.06	−0.010
Mood alteration scale	0.51***	0.338**	0.60***	0.400***	0 45**	0 076	0.41*	0.124
Social/contextual scale	0 66***	0.253*	0.52***	0 270*	0.73***	0.594**	0.60***	0.476*
Extent of peer use	0.30***	0 267**	0.34***	0.192*	0 38*	0.128	0.43*	0.019
Intercept		0 210		0.189		−0.053		0.359
Adjusted R^2		0.34***		0 40***		0.48***		0.30*

[1]2-tailed probabilities; [2]Spearman's rho for bivariate correlation with dependent variable. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

these analyses ranged from 31:1 (alcohol) to 7:1 (ecstasy), exceeding the minimum ratio considered acceptable for multiple regression analysis (Tabachnick & Fidell, 1989). The results are shown in Table 3.

Subjects' age and sex did not make significant contributions to any of the regression equations. For alcohol, 34% of the variability in future intention to drink again was predicted from the scores on the three covariates. A similar result for cannabis was observed. Here, 40% of the variability in intention scores was predicted by the covariates, with the Mood Function score exerting a relatively stronger predictive effect ($\beta = 0.400$) than the other covariates. A different result emerged from the analysis of the intentions to use ecstasy and amphetamines. For ecstasy, the Social/Contextual function scale was the only significant predictor ($\beta = 0.476$). A similar and somewhat stronger result was seen for amphetamines, with 48% of the variability in intentions accounted for, with the Social/Contextual function score as the sole significant predictor ($\beta = 0.594$).

Discussion

This paper has explored the personal and social influences on substance use and intentions to use in a sample of 16–21-year-olds. Data collection focused on the respondents' perceived functions for their use, the life-time experience of negative effects, the extent of peer involvement and future use intentions. Our results provide evidence that substance consumption by young people can serve specific mood altering and social functions and that these may prove useful in predicting their intentions to use again in the future. The results also call into question the extent to which negative effects from drug use directly influence subsequent drug-related behaviours.

A common approach in drug prevention in the UK has been to highlight the potential negative effects from use. However, we found that in our sample correlations between the life-time experience of negative effects and the frequency and intensity of substance use were low. It appears that for this group of young people, negative experiences arising from substance use had not been sufficient to discourage future consumption. The implications from these data are that education and prevention programmes may be strengthened by using new approaches to deter use. However, since our questionnaire recorded life-time prevalence of negative effects, it is possible that those that were reported had been experienced some time ago. In such cases, use might have been modified soon after these experiences in order to avoid similar consequences in the future.

Drug use has a long history of being linked to influences exerted by the individual's peer group. We measured the perceived extent of peer substance involvement and examined its relationship with consumption patterns in our sample. The results showed that this variable was significantly correlated with the respondents' frequency and typical intensity of cannabis use and their frequency of drinking alcohol. A positive but non-significant association was also found between peer and individual use of amphetamines and ecstasy. This is perhaps unsurprising, as the use of both alcohol and cannabis could be described as a social activity in itself. In contrast, the use of amphetamines and ecstasy, while often occurring in a social context, is more likely to be associated with additional activity such as dancing.

From the results of our regression analyses it appears that the perceived likelihood of taking a substance in the future may be understood in terms of the functions served by its use. For cannabis and alcohol, perceived mood alteration and social/contextual functions, together with the extent of peer involvement predicted intentions to use. For amphetamines and ecstasy, our analyses suggested that there may be a tendency for social/contextual, but not mood altering functions to be more influential on future use.

Overall, our findings support the recommendation that educators and prevention programme planners should recognize the complexity of the reasons behind substance use and then encourage young people to seek alternative ways of fulfilling them (Newcomb *et al.*, 1988; Boys *et al.*, in press). However, we suggest that research should focus more on measuring the perceived *functions* for use in contrast with more generalized reasons for use. This approach could yield data leading to more specific suggestions for alternative ways for fulfilling individual and social functions (which do not involve drug taking). Additionally, profiling the functions for the use of different drugs might help to predict which substances are likely to be substituted for one another (Boys, Marsden & Griffiths, 1999).

Assessing the specific functions for substance use among young people may prove to be an important new territory for prevention research. This approach could help to predict whether a substance is used on a regular basis after experimentation and may also contribute to the modelling of other aspects of substance-related decision-making. Overall, it appears from the present study that different substances fulfil different functions for the young consumer. If these results are confirmed in larger-scale studies, it suggests that educational and preventative efforts need to recognize these functional differences and tailor their content accordingly.

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References

AZJEN, I. (1985) From decisions to actions: a theory of planned behaviour, in: KUHL, J. & BECKMANN, J. (Eds) *Action-control: from cognition to behaviour*, pp. 11–39 (New York, Springer).

AZJEN, I. (1988) *Attitudes, Personality and Behaviour* (Homewood, IL, Dorsey Press).

BAILEY, S. L., FLEWELLING, R. L. & RACHAL, J. V. (1992) Predicting continued use of marijuana among adolescents: the relative influence of drug-specific and social context factors, *Journal of Health and Social Behavior*, 33, 51–66.

BAUMAN, K. E. & ENNETT, S. T. (1996) On the importance of peer influence for adolescent drug use: commonly neglected considerations, *Addiction*, 91, 185–198.

BOYS, A., MARSDEN, J. & GRIFFITHS, P. (1999) Reading between the lines: is cocaine becoming the stimulant of choice for urban youth? *Druglink*, Jan/Feb, 20–22.

BOYS, A., MARSDEN, J., FOUNTAIN, J., GRIFFITHS, P., STILLWELL, G. & STRANG, J. (1999) What influences young people's use of drugs? A qualitative study of decision-making, *Drugs: Education, Prevention and Policy*, in press.

BROOK, J. S., WHITEMAN, M., GORDON, A. S. & COHEN, P. (1986) Dynamics of childhood and adolescent personality traits and adolescent drug use, *Developmental Psychology*, 22, 403–414.

BUREAU OF JUSTICE ASSISTANCE, US DEPARTMENT OF JUSTICE (1988) *Implementing Project DARE: drug abuse resistance education* (Washington, DC, Bureau of Justice Assistance).

BUTLER, M. C., GUNDERSON, E. K. E. & BRUNI, J. P. (1981) Motivational determinants of illicit drug use: an assessment of underlying dimensions and their relationship to behaviour, *International Journal of the Addictions*, 16, 243–252.

CARMAN, R. S. (1979) Motivations for drug use and problematic outcomes among rural junior high school students, *Addictive Behaviors*, 4, 91–93.

CATO, B. M. (1992) Youth's recreation and drug sensations: is there a relationship? *Journal of Drug Education*, 22, 293–301.

CENTRAL DRUGS COORDINATION UNIT (1998) *Tackling Drugs to Build a Better Britain, the government's 10-year strategy for tackling drug misuse*, (London, Stationery Office).

COGGANS, N. & MCKELLAR, S. (1994) Drug use amongst peers: Peer pressure or peer preference? *Drugs: Education Prevention and Policy*, 1, 15–26.

EUROPEAN MONITORING CENTRE FOR DRUGS AND DRUG ADDICTION (1997) *Annual Report on the State of the Drugs Problem in the European Union* (Lisbon, EMCDDA).

EPSTEIN, J. A., BOTVIN, G. J., DIAZ, T., TOTH, V. & SCHINKE, S. P. (1995) Social and personal factors in marijuana use and Intention to use drugs among inner city minority youth, *Developmental and Behavioural Paediatrics*, 1, 14–20.

ELLIOTT, D. S., HUIZINGA, D. & MENARD, S. (1989) *Multiple Problem Youth: delinquency, substance use and mental health problems* (New York, Springer-Verlag).

ELLIOTT, D. S., HUIZINGA, D. & AGETON, S. S. (1985) *Explaining Delinquency and Drug Use* (Beverly Hills, CA, Sage).

HADEN, T. L. & EDMUNDSON, E. W. (1991) Personal and social motivations as predictors of substance use among college students, *Journal of Drug Education*, 21, 303–312.

HEALTH EDUCATION AUTHORITY/BMRB INTERNATIONAL (1997) *Drug Use in England: results of the 1995 National Drugs Campaign survey* (London, Health Education Authority).

HUBA, G. J., NEWCOMB, M. D. & BENTLER, P. M. (1986) Adverse drug experiences and drug use behaviors: a one-year longitudinal study of adolescents, *Journal of Paediatric Psychology*, 11, 203–219.

JESSOR, R. & JESSOR, S. L. (1977) *Problem Behavior and Psychosocial Development: a longitudinal study of youth* (San Diego, CA, Academic Press).

JOHNSTON, L. D. & O'MALLEY, P. M. (1986) Why do the nation's students use drugs and alcohol? Self reported reasons from nine national surveys, *Journal of Drug Issues*, 16, 29–66.

JOHNSTON, L. D., O'MALLEY, P. M. & BACHMAN J. G. (1997) *National Survey Results on Drug Use from the Monitoring the Future Study, 1975–1996; secondary school students* (Rockville, MD, US Department of Health and Human Services, National Institute on Drug Abuse).

KANDEL, D. B. (1985) On processes of peer influences in adolescent drug use: a developmental perspective, *Advances in Alcohol and Substance Abuse*, 4, 139–163.

LANGER, L. M. & WARHEIT, G. J. (1992) The pre-adult health decision-making model: linking decision-making directedness/orientation to adolescent health related attitudes and behaviours, *Adolescence*, 27, 919–948.

LETTIERI, D. J., SAYER, M. & PEARSON, H. W. (1980) *Theories on Drug Abuse: selected contemporary perspectives*, NIDA research monograph 30 (Washington, DC, US Government Printing Office).

MARSDEN, J., GOSSOP, M., STEWART, D. *et al.* (1998) The Maudsley Addiction Profile (MAP): a brief instrument for assessing treatment outcome, *Addiction* 93, 1857–1867.

MCKAY, J. R., MURPHY, R. T., MCGUIRE, J., RIVINUS, T. R. & MAISTO, S. A. (1992) Incarcerated adolescents' attributions for drug and alcohol use, *Addictive Behaviours*, 17, 227–235.

NATIONAL INSTITUTE ON DRUG ABUSE (1997) *Preventing Drug Abuse Among Children and Adolescents* (Rockville, MD, National Institutes of Health Publication).

NEWCOMB, M. D., CHOU, C-P., BENTLER, P. M. & HUBA, G. J. (1988) Cognitive motivations for drug use among adolescents: longitudinal tests of gender differences and predictors of change in drug use, *Journal of Counselling Psychology*, 35, 426–438.

PERTRAITIS, J., FLAY, B. R. & MILLER, T. Q. (1995) Reviewing theories of adolescent substance use: organizing pieces in the puzzle, *Psychological Bulletin*, 117, 67–86.

RAMSAY, M. & SPILLER, J. (1997) *Drug Use Declared in 1996: latest results from the British Crime Survey* (London, Home Office).

ROBINS, L. N. (1980) The natural history of drug abuse, *Acta Psychiatrica Scandanavica*, 62 (suppl. 284), 7–20.

SEGAL, B., HUBA, G. J. & SINGER, J. L. (1980) Reasons for drug and alcohol use by college students, *International Journal of the Addictions*, 15, 489–498.

SEGAL, B., CROMER, F., HOBFOLL, S. & WASSERMAN, P. (1982) Patterns of reasons for drug use among detained and adjudicated juveniles, *International Journal of the Addictions*, 17, 1117–1130.

SEGAL, B. (1985–86) Confirmatory analyses of reasons for experiencing psychoactive drugs during adolescence, *International Journal of the Addictions*, 20, 1649–1662.

TABACHNICK, B. G. & FIDELL, L. S. (1989) *Using Multivariate Statistics*, 2nd edn (New York, Harper Collins).

VAN METER, K. M. (1990) Methodological and design issues: techniques for assessing the representatives of snowball samples, in: LAMBERT, E. Y. (Ed.) *The Collection and Interpretation of Data from Hidden Populations*, pp. 31–33 (Rockville MD, National Institute on Drug Abuse).

WHELAN, S. & CULVER, J. (1997) *'Don't say "no", say DARE'? Summary of an outcome evaluation of a Drug Abuse Resistance Education programme in Mansfield* (Nottinghamshire, North Nottinghamshire Health Promotion).

Table J1 Lifetime prevalence, age of first use and past year prevalence for nine substance types by gender

Substance	*Lifetime use*			*Mean age of first use*			*Past year use*		
	Females (n=45)	Males (n=55)	χ^2	Females (n=45)	Males (n=55)	*t-test*	Females (n=45)	Males (n=55)	χ^2
Cigarettes (n=94)	42	52	0.06	13.43	13.27	-0.32	30	45	2.63
Alcohol (n=100)	45	55	-	13.96	14.29	0.89	45	54	-[a]
Cannabis (n=89)	38	51	1.73	15.05	15.35	-1.55	31	49	5.04*
Amphetamines (n=56)	23	33	0.79	16.13	16.42	0.62	17	17	2.85
Ecstasy (n=38)	14	24	1.65	16.86	17.00	0.23	12	16	1.65
LSD (n=35)	13	22	1.34	16.54	16.45	-0.13	2	13	6.37*
Heroin (n=13)	2	11	5.62*	18.00	18.71	0.31	1	6	0.14
Opiates (n=5)	1	4	1.52	18.00	20.00	-	1	1	-
Benzodiazepines (n=6)	2	4	0.43	16.00	19.00	-	1	1	-

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

[a] Computed by Fisher's exact test

- Number of cases is too small to calculate statistics

Table J2 Summary of substance use history by current age

Substance	*Lifetime use by current age*			*Past year use by current age*		
	Ever used	Never used	*t*	Used in past year	not used in past year	*t*
Cigarettes (n=94)	18.77	19.33	-0.77	18.59	19.56	-2.69*
Alcohol (n=100)	18.80	-	-	18.78	21.00	1.27
Cannabis (n=89)	18.83	18.55	0.51	18.76	19.44	-1.48
Amphetamines (n=56)	19.04	18.50	1.53	19.03	19.05	0.03
Ecstasy (n=38)	19.47	18.39	3.15**	19.36	19.80	0.83
LSD (n=35)	19.40	18.48	2.59*	19.07	19.65	-1.11
Heroin (n=13)	20.23	18.59	3.32**	19.71	20.83	-1.68
Opiates (n=5)	20.20	18.73	1.86	-	-	-
Benzodiazepines (n=6)	20.33	18.70	2.26*	-	-	-

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

- Number of cases is too small to calculate t-statistics

Table J3 Summary of drug use in past 90 days by gender

Substance (ever used)	Males	Females	χ^2
Cigarettes (n=94)	43	30	0.04
Alcohol (n=100)	51	42	0.01
Cannabis (n=89)	42	24	2.21
Amphetamines (n=56)	9	14	6.12*
Ecstasy (n=38)	12	10	0.08
LSD (n=35)	11	1	6.08*

* $p < 0.05$

Table J4 Mean scores for each function item by substance together with t-tests for gender differences

Function Item	Alcohol (n=99)		Cannabis (n=80)		Ecstasy (n=28)		Amphetamines (n=34)	
	Mean	*t*	mean	*t*	mean	*t*	mean	*t*
To feel better when low or depressed?	1.55	0.720	1.63	0.258	0.93	-1.53	0.68	-0.801
To help you to relax?	1.79	1.39	2.64	1.27	0.57	-0.058	0.47	0.322
To help you to feel more confident in a social situation?	1.51	0.250	0.79	1.41	1.36	-1.11	1.12	-1.965
To help you to let go of inhibitions?	1.66	-0.561	0.99	-0.286	1.57	-0.853	0.94	-2.045
To get intoxicated?	1.95	0.549	1.59	1.43	2.07	-1.76	1.59	-1.073
To help you to keep going on a night out with friends?	1.41	0.735	0.79	2.33*	2.46	-1.52	2.59	-0.830
To help to make an everyday activity less boring?	0.87	0.016	1.74	2.26*	0.75	0.338	0.82	-0.278
To enjoy the company of your friends?	1.88	-0.357	1.76	0.260	1.64	-0.95	1.15	-0.753
To help you to feel closer to someone?	1.01	0.727	0.96	0.574	1.57	0.226	0.68	-0.179
TOTAL SCALE SCORE	13.6	0.518	12.9	1.59	12.9	-1.15	10.27	-1.163
Cronbach's alpha coefficient	0.89		0.82		0.81		0.82	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table J5 Reported negative effects associated with lifetime use of four substances prior to interview together with t-tests and and χ^2 statistics for age and gender differences (n=100)

Negative effect item	Alcohol (n=100)			Cannabis (n=89)			Ecstasy (n=38)			Amphetamines (n=56)		
	n (%)	χ^2	*t*	n (%)	χ^2	*t*	n (%)	χ^2	*t*	n (%)	χ^2	*t*
Felt sick or unwell when using [drug]?	93 (93%)	2.124	1.490	56 (63%)	0.234	-0.069	24 (63%)	3.926*	1.829	26 (46%)	0.836	1.275
Taken more/a stronger dose than you would have liked to when using [drug]?	89 (89%)	0.001	0.694	51 (57%)	1.952	-0.662	18 (47%)	0.062	- 1.989	24 (43%)	0.006	0.494
Wished the effects would reduce or stop when using [drug]?	94 (94%)	0.351	1.159	57 (64%)	1.414	-1.804	17 (45%)	0.730	- 0.234	28 (50%)	0.074	0.155

* $p < 0.05$

Table J6 Pearson's correlations between main variables for alcohol users (n=99)

Alcohol (n=93)	Age	Gender	Freq of use	Amount	Future use	Func-tions	Neg. effects	Peer life use
Age								
Gender[a]	-0.117							
Frequency	0.011	0.082						
Amount	-0.205*	-0.247	0.379***					
Future use	0.013	-0.059	0.534***	0.434***				
Functions	-0.077	-0.053	0.532***	0.496***	0.517***			
Neg. effects	0.092	-0.045	0.081	0.030	-0.004	0.217*		
Peer life use	-0.023	0.000	0.277**	0.199	0.191	0.226*	0.287**	
Peer current use	0.004	0.10	0.283**	0.146	0.277**	0.115	0.175*	0.765***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

[a] binary variable

Table J7 Pearson's correlations between main variables for cannabis users (n=80)

Cannabis (n=89)	Age	Gender	Freq. of use	Amount	Future use	Func-tions	Neg. effects	Peer life use
Age								
Gender[a]	-0.221*							
Frequency	-0.218*	-0.191*						
Amount	0.056	0.435***	0.554***					
Future use	-0.178	-0.101	0.632***	0.285*				
Functions	-0.237*	-0.177	0.520***	0.250*	0.539***			
Neg. effects	-0.136	0.162	-0.137	-0.252*	-0.184	0.001		
Peer life use	-0.284*	0.098	0.240*	0.069	0.261*	0.226*	0.139	
Peer current use	-0.266**	-0.042	0.418***	0.250*	0.385***	0.215*	-0.142	0.633***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

[a] binary variable

Table J8 Pearson's correlations between main variables for amphetamine users (n=34)

Amphetamines (n=34)	Age	Gender	Freq. of use	Amount	Future use	Functions	Neg. effects	Peer life use
Age								
Gender[a]	-0.087							
Frequency	0.434*	0.072						
Amount	0.231	-0.069	0.312					
Future use	0.255	0.276	0.571***	0.352				
Functions	0.197	0.238	0.411*	0.248	0.580***			
Neg. effects	-0.064	-0.083	0.061	0.257	0.002	0.161		
Peer life use	0.007	0.195	0.169	0.248	0.091	0.214	0.446**	
Peer current use	0.069	0.057	0.331*	0.385	0.337	0.386*	0.462**	0.783***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

[a] binary variable

Table J9 Pearson's correlations between main variables for ecstasy users (n=28)

Ecstasy (n=28)	Age	Gender	Freq. of use	Amount	Future use	Func-tions	Neg. effects	Peer life use
Age								
Gender[a]	0.035							
Frequency	0.152	0.055						
Amount	0.181	-0.162	0.473**					
Future use	0.145	0.058	0.477**	0.291				
Functions	0.134	0.220	0.425*	0.381	0.361*			
Neg. effects	-0.008	-0.225	0.017	0.342	-0.042	0.013		
Peer life use	0.261	0.224	0.244	0.408	0.436*	0.395*	0.087	
Peer current use	0.184	0.095	0.622***	0.526**	0.418*	0.400*	-0.001	0.843***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

[a] binary variable

Table J10 Standard multiple regression modelling frequency of alcohol use in past 90 days (DV) n=99

Predictor variables	DV	Age	Gender	Functions	Neg. effects	Peer use	*B*	*β*
Age	0.011						1.172	0.071
Gender	0.082	-0.117					6.453	0.113
Functions	0.532***	-0.077	-0.053				1.812	0.533***
Negative effects	0.081	0.092	-0.045	0.217*			-0.829	-0.076
Peer use	0.283**	0.004	0.10	0.115	0.175*		8.894	0.228**
Means	51.0	18.8	1.45	13.6	6.04	3.53	Intercept = -31.438	
s.d.	28.6	1.74	0.50	8.43	2.61	0.73		
							$R^2 = 0.351$	
							Adjusted $R^2 = 0.316$	
							$R = 0.592^{***}$	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table J11 Standard multiple regression modelling frequency of cannabis use in past 90 days (DV) n=89

Predictor variables	DV	Age	Gender	Functions	Neg. effects	Peer use	*B*	*β*
Age	-0.218*						-1.021	-0.077
Gender	-0.191*	-0.221*					-5.284	-0.107
Functions	0.520***	-0.237*	-0.177				1.461	0.420***
Negative effects	-0.137	-0.136	0.162	0.001			-1.003	-0.089
Peer use	0.418***	-0.266**	-0.042	0.215*	-0.142		8.764	0.290**
Means	48.8	18.8	1.39	12.9	2.83	2.91	Intercept = 33.783	
s.d.	24.1	1.83	0.49	6.94	2.15	0.80		
							$R^2 = 0.389$	
							Adjusted $R^2 = 0.348$	
							$R = 0.624^{***}$	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table J12 Standard multiple regression modelling frequency of amphetamines use in past 90 days (DV) n=34

Predictor variables	DV	Age	Gender	Functions	Neg. effects	Peer use	*B*	*β*
Age	0.262						2.007	0.228
Gender	0.337*	-0.151					8.133	0.283
Functions	0.532***	0.174	0.205				0.817	0.377*
Negative effects	0.151	0.038	-0.004	0.295*			-0.333	-0.063
Peer use	0.342*	0.076	0.060	0.414**	0.517***		2.544	0.185
Means	35.8	19.1	1.52	10.3	2.36	1.94	Intercept = -27.413	
s.d.	14.6	1.65	0.51	6.73	2.78	1.06		
							$R^2 = 0.409$	
							Adjusted $R^2 = 0.300$	
							$R = 0.640^*$	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table J13 Standard multiple regression modelling frequency of ecstasy use in past 90 days (DV) n=28

Predictor variables	DV	Age	Gender	Functions	Neg. effects	Peer use	*B*	*β*
Age	0.152						0.221	0.035
Gender	0.055	0.035					-1.004	-0.052
Functions	0.425*	0.094	0.220				0.310	0.221
Negative effects	0.017	-0.008	-0.225	0.013			-0.105	-0.031
Peer use	0.622***	0.184	0.095	0.400*	-0.001		4.696	0.532**
Means	23.4	19.4	1.43	12.9	2.89	1.96	Intercept = 7.652	
s.d.	9.75	1.52	0.50	6.95	2.85	1.10		
							$R^2 = 0.428$	
							Adjusted $R^2 = 0.298$	
							$R = 0.654^*$	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table J14 Standard multiple regression modelling future expectations (DV) regarding alcohol use (n=99)

Predictor variables	DV	Age	Gender	Frequency of use	Functions	Neg. effects	Peer use	*B*	*β*
Age	0.013							0.023	0.043
Gender	-0.059	-0.117						-0.141	-0.075
Frequency of use	0.534***	0.009	0.097					0.011	0.325***
Functions	0.517***	-0.077	-0.053	0.493***				0.041	0.370***
Negative effects	-0.004	0.092	-0.045	0.100	0.217*			-0.056	-0.154
Peer use	0.277**	0.004	0.010	0.283**	0.115	0.175*		0.218	0.170*
Means	5.22	18.8	1.45	34.8	13.6	6.04	3.53	Intercept = 1.906	
s.d.	1.45	1.74	0.50	29.0	8.43	2.61	0.73		
								$R^2 = 0.418$	
								Adjusted $R^2 = 0.380$	
								$R = 0.646^{***}$	

$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

Table J15 Standard multiple regression modelling future expectations (DV) regarding cannabis use (n=80)

Predictor variables	DV	Age	Gender	Frequency of use	Functions	Neg. effects	Peer use	*B*	*β*
Age	-0.178							0.014	0.024
Gender	-0.101	-0.221*						0.151	0.071
Frequency of use	0.632***	-0.210*	-0.194*					0.013	0.429***
Functions	0.539***	-0.237*	-0.177	0.468***				0.049	0.327***
Negative effects	-0.184	-0.136	0.162	-0.117	0.001			-0.060	-0.123
Peer use	0.385***	-0.266**	-0.042	0.399***	0.215*	-0.142		0.176	0.135
Means	4.63	18.8	1.39	41.9	12.9	2.83	2.91	Intercept = 1.358	
s.d.	1.87	1.83	0.49	35.6	6.94	2.15	0.80		
								R^2 = 0.510	
								Adjusted R^2 =0.470	
								*R = 0.714****	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table J16 Standard multiple regression modelling future expectations (DV) regarding amphetamine use (n=33)

Predictor variables	DV	Age	Gender	Frequency of use	Functions	Neg. effects	Peer use	*B*	*β*
Age	0.242							0.036	0.042
Gender	0.266	-0.151						0.467	0.166
Frequency of use	0.568***	0.429**	0.058					0.042	0.361*
Functions	0.572***	0.174	0.205	0.396*				0.080	0.379*
Negative effects	0.068	0.038	-0.004	0.075	0.295*			-0.068	-0.132
Peer use	0.340*	0.076	0.060	0.333*	0.414**	0.517***		0.159	0.118
Means	2.84	19.1	1.52	8.33	10.3	2.36	1.94	Intercept = 0.032	
s.d.	2.37	1.65	0.51	12.1	6.73	2.78	1.06		
								$R^2 = 0.507$	
								Adjusted $R^2 = 0.393$	
								$R = 0.712^{**}$	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table J17 Standard multiple regression modelling future expectations (DV) regarding ecstasy use (n=28)

Predictor variables	DV	Age	Gender	Frequency of use	Functions	Neg. effects	Peer use	*B*	*β*
Age	0.145							0.046	0.008
Gender	0.058	0.035						-0.041	-0.023
Frequency of use	0.477**	0.236	0.014					0.036	0.350
Functions	0.361*	0.094	0.220	0.405*				0.017	0.133
Negative effects	-0.042	-0.008	-0.225	0.167	0.013			-0.034	-0.107
Peer use	0.418*	0.184	0.095	0.389*	0.400*	-0.001		0.189	0.229
Means	3.87	19.4	1.43	7.36	12.9	2.89	1.96	Intercept = 2.563	
s.d.	2.36	1.52	0.50	8.81	6.95	2.85	1.10		
								$R^2 = 0.315$	
								Adjusted $R^2 = 0.119$	
								R = 0.561 ns	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Interview ID ☐ ☐ ☐ Date ☐ ☐ / ☐ ☐ / 1998

A1. Your sex: Male ☐ Female ☐ **A2. How old are you?** ☐ Yrs

A3. How would you describe your ethnic group?

White ☐ Black-Caribbean ☐ Black-African ☐ Black-other ☐ Indian ☐ Pakistani ☐

Bangladeshi ☐ Chinese ☐ Other ☐

Please specify: .....

A4. How old were you when you left school? ☐☐ Years (code 88 if still in school)

A5. What is the highest qualification that you have to date?

CSE/GNVQ1 ☐ GCSE/GNVQ2 ☐ GNVQ3/BTEC ☐ A-level/GNVQ4 ☐ Diploma ☐ Degree (or higher) ☐

Other ☐ Please specify:

A6. What is your current occupation?

Education (full-time) ☐ Education (part-time) ☐ Working (full-time) ☐ Working (part-time) ☐ Unemployed ☐

Interview ID ☐ ☐ ☐ Date ☐ ☐ / ☐ ☐ / 1998

Interviewer ☐

UNIVERSITY OF LONDON

STUDY ON YOUNG PEOPLE

Project Coordinator: Annabel Boys
4, Windsor Walk
London SE5 8AF
Tel. 0171-919-3804

SECTION A: BACKGROUND INFORMATION

A1. Your sex: Male ☐ Female ☐ **A2. How old are you?** ☐ Years

A3. How would you describe your ethnic group?

White ☐ Black-Caribbean ☐ Black-African ☐ Black-other ☐ Indian ☐ Pakistani ☐

Bangladeshi ☐ Chinese ☐ Other ☐ Please specify:.....

A4. How old were you when you left school? ☐ Years (code 88 if still in school)

A5. What is the highest qualification that you have to date?

CSE/ GNVQ1 ☐ GCSE/ GNVQ2 ☐ GNVQ3/ BTEC ☐ A-level/ GNVQ4 ☐ Diploma ☐ Degree (or higher) ☐

Other ☐ Please specify:

A6. What is your current occupation?

Education (full-time) ☐ Education (part-time) ☐ Working (full-time) ☐ Working (part-time) ☐ Unemployed ☐

A7. In general, how well would you say you did at school on a scale of 1 to 7, where 1= very poorly and 7= very well? *[Card A - please circle number]*

VERY POORLY ❶ - ❷ - ❸ - ❹ - ❺ - ❻ - ❼ VERY WELL

A8. Have you EVER been excluded from school? Yes ☐ No ☐

THE NEXT FEW QUESTIONS ARE ABOUT WHERE YOU ARE LIVING AT THE MOMENT

A9. What is your current type of accommodation?

Parent's home ☐ Rented flat/house ☐ Council/ Housing Assoc. ☐ Own flat/house ☐ Hostel ☐ No Fixed Addr ess ☐

Other ☐ Please specify:

A10. Who lives there with you?

Parent(s) ☐ Brothers/Sisters ☐ Other family ☐ Partner ☐ Friends ☐ Live alone ☐

Other ☐ Please specify:

THE FINAL QUESTIONS IN THIS SECTION ARE ABOUT MONEY

A11. Roughly how much money do you have in a <u>typical month</u> from all sources?

£

A12. Roughly how much money do you have in a <u>typical month</u> after you have paid for essential things like accommodation, bills and food?

£

SECTION B-G: DRUGS (ECSTASY, CANNABIS, ALCOHOL, LSD, COCAINE, AMPHETAMINES)

Note: THIS SECTION WAS REPEATED FOR EACH OF THE SIX DRUGS

D1. Have you ever used ecstasy?

Yes ☐ No ☐

If NO..... skip to Section E, Page 40

D 2. How old were you when you first used ecstasy? ☐ *Years*

D 3. About how many times in total do you think you have used ecstasy? *[Card C]*

Once only ☐ | 2-10 times ☐ | 11-20 times ☐ | 21-50 times ☐ | 51-100 times ☐ | Over 100 times ☐

If "Never" used ecstasy in the past 12 months - please skip to D17 page 31

D 4. In the past 3 months, on approximately how many days have you used ecstasy? *[Card E]*

☐ Days [If "Never" used ecstasy in the past 3 months - please skip to page 29]

D 5. In the last 3 months, how much ecstasy have you used on a typical day when using?

☐ *tablets, or amount spent*

D 6. In the past 12 months, what has been the main way you have taken ecstasy?

Swallow ☐ Snort/sniff ☐ Smoke/ Chase ☐ Inject ☐

[Card F]

IN THE PAST <u>12 MONTHS</u>.....

	Never	Rarely	Sometimes	Often	Always
D7. How often have you been pre-occupied by thoughts about using ecstasy?					
D8. How often have you been worried or concerned about your use of ecstasy?					
D9 . How often has your ecstasy use led to problems with family, friends, work etc?					
D10. How often have you prioritised spending money on ecstasy over other things?					
D11. How often has your use of ecstasy led to you neglect to do what was NORMALLY expected of you (like turning up for college/ work, or missing appointments)?					
D12. How often have you regretted what you did when you were high or intoxicated on ecstasy?					
D13. How often have you used more ecstasy than you intended to?					

THESE NEXT QUESTIONS ARE ABOUT THE THINGS ECSTASY DOES FOR YOU

D 14. HAVE YOU EVER USED ECSTASY . . . *[Card F]*	Never	Rarely	Sometimes	Often	Always
a. To make yourself feel better when down or depressed? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
b. To help you keep going on a night out with friends? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
c. To help you to feel elated or euphoric? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
d. Just to really get stoned or intoxicated? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
e. To help you to lose weight? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
f. To help you enjoy the company of your friends? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					

HAVE YOU EVER USED ecstasy . . . *[Card F]*

	Never	Rarely	Sometimes	Often	Always
g. To help you to relax? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
h. To enhance or improve the effects of other drugs? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
i. To help ease the AFTER effects of other drugs? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
j. To help you feel more confident or more able to talk to people in a social situation? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
k. To help you to stay awake? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
l. To help you lose your inhibitions? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
m. To enhance feelings when having sex? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					

HAVE YOU EVER USED ecstasy . . . *[Card F]*	Never	Rarely	Sometimes	Often	Always
n. To help you to stop worrying about a problem? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
o. To help make something you were doing less boring? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
p. To help you to sleep? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
q. To help you to concentrate or to work or study? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					
r. To enhance an activity such as listening to music or playing a game or a sport? No ☐ Yes ☐ When you've used ecstasy in the last year, how often has it been for this purpose?					

THESE ARE SOME QUESTIONS ABOUT THINGS YOU MAY NOT HAVE LIKED ABOUT ecstasy . . .

D 15. HAVE YOU EVER . . . *[Card F]*

	Never	Rarely	Sometimes	Often	Always
a. Felt sick or unwell as a result of using ecstasy? No ☐ Yes ☐ When you've used ecstasy in the last year, how often have you experienced this?					
b. Wished that the effects of ecstasy would reduce or stop when you were using? No ☐ Yes ☐ When you've used ecstasy in the last year, how often have you experienced this?					
c. Felt anxious or nervous as a result of using ecstasy? No ☐ Yes ☐ When you've used ecstasy in the last year, how often have you experienced this?					
d. Had an accident or took unnecessary risks as a result of using ecstasy? No ☐ Yes ☐ When you've used ecstasy in the last year, how often have you experienced this?					

D 31. How likely do you think it is that you will use ecstasy in the next 12 months on a scale of 1-7, where 1= definitely not and 7= definitely will? *[Card G - please circle number]*

DEFINITELY NOT ❶ - ❷ - ❸ - ❹ - ❺ - ❻ - ❼ DEFINITELY WILL

SECTION H: OTHER DRUGS

H 1. Have you ever smoked a cigarette?

Yes ☐ No ☐

H 2. If yes, roughly how many cigarettes have you smoked on a typical per day in the last 3 months?

H3 . Which of the following list of drugs have you EVER used?

Nitrites (poppers) ☐

Solvents (e.g. glues, paints)? ☐

Gases (e.g. aerosols) ☐

Fuels (e.g.lighter fuel) ☐

Heroin ☐

Crack-cocaine ☐

Non-prescribed Tranquillisers ☐

Others ☐

Please specify:

1. .....
2. .....
3. .....
4. .....

THE FINAL QUESTIONS IN THIS SECTION ARE ABOUT DRUGS AND ALCOHOL AND YOUR FRIENDS

H 4. Could you estimate the proportion of your friends who ...(Card J).

	Alcohol	Cannabis	Ecstasy	Amphet.	LSD	Cocaine
a) Have ever used the following drugs?						
b) Will use the following drugs again in the next year?						

H 5. Do you currently have a boyfriend or girlfriend?

Yes ☐ No ☐ If "No", complete H6 for "best friend"

H 6.

	Alcohol	Cannabis	Ecstasy	Amphet.	LSD	Cocaine
a) Which of the following drugs do you think your current partner (or best friend) has EVER used?						
b) Which of the following drugs do you think your current partner (or best friend) will use again in the next 12 months?						

INTERVIEW RECORD SHEET

Interview ID ☐ ☐ ☐ Date ☐ ☐ / ☐ ☐ / 1998

Interviewer name .....

1. Where did the interview take place?

Interviewer's home ☐ Respondent's home ☐ A friend's home ☐ In a café, pub or club ☐ In a park ☐

Other ☐ Please specify: .....

2. How long did the interview take? ☐ Minutes

3. Who was the respondent?

Friend ☐ Relative ☐ Friend of another respondent ☐ Casual acquaintance ☐

Other ☐ Please specify: .....

Any comments about the interview?

Appendix L Eligibility check used by peer interviewers in Study Three

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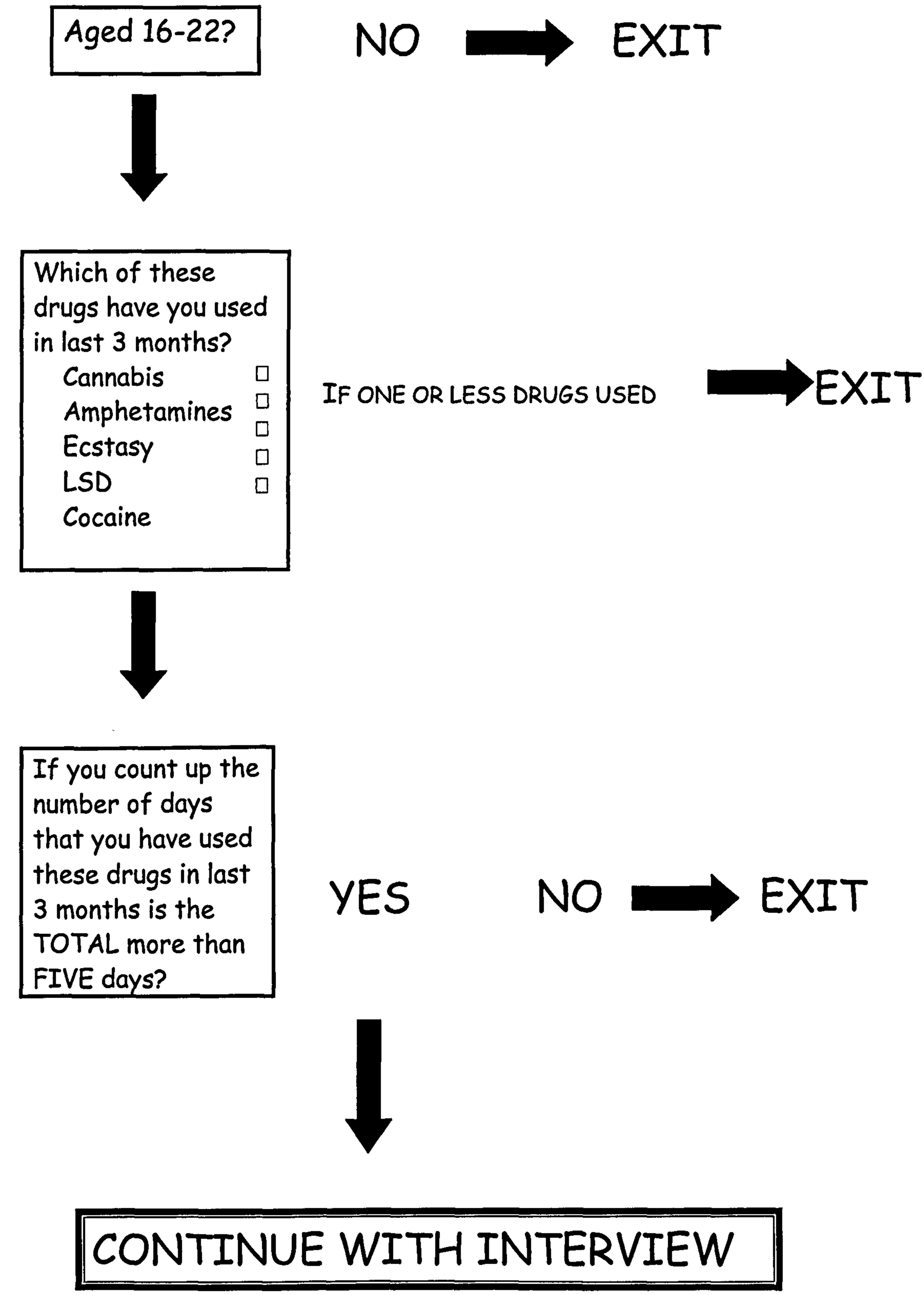

Appendix M Interview Pre-amble for Study Three

This study is gathering information about young people and drug and alcohol use. The purpose of this is to help to inform health education work. Thank you for agreeing to take part in this research – it is only with the help and co-operation of people like you that resources and educational materials can be developed to be more relevant and useful for young people.

I'd like to reassure you that any information that you give to me is CONFIDENTIAL and cannot be traced back to you as an individual. The data collected is anonymous – your name is not written down on the questionnaire.

The interview should last around an hour. If there are any questions that you do not understand or do not wish to answer please tell me. Your participation is this study is entirely voluntary.

I would like to record the interview so that the answer that I write on the questionnaire can be checked for accuracy. The recording will be destroyed when the project ends. Do you have any objections to this?

TURN TAPE RECORDER ON then continue reading...

It is important that you understand that you have the right to terminate the interview at any point or to refuse to answer any questions that you do not with to answer. Could you confirm for the tape that you understand this and still wish to continue with the interview?

Do you have any questions before we start?

Appendix N Eighteen function items used in Study Three

Domain	*Item*
Changing mood	To make yourself feel better when down or depressed.
	To help you stop worrying about a problem.
	To help you to relax.
	To help you feel elated or euphoric.
	Just get really stoned or intoxicated.
Physical effects	To enhance feelings when having sex.
	To help you to stay awake
	To help you lose weight.
	To help you to sleep.
Social purposes	To help you enjoy the company of your friends
	To help feel more confident or more able to talk to people in a social situation.
	To help you lose your inhibitions
	To help you to keep going on a night out with friends
Facilitate activity	To help you to concentrate or to work or study
	To enhance an activity such as listening to music or playing a game or sport
	To help make something you were doing less boring
Manage effects from other substances	To improve the effects of other substances
	To help ease the after effects of other substances

Table 1 Completed sampling matrix 1

Age band	Males	Females	**Total**
16-17	35 (46.7%)	40 (53.3%)	**75 (100%)**
18-19	69 (58.0%)	50 (42.0%)	**119 (100%)**
20-22	101 (59.4%)	69 (40.6%)	**170 (100%)**
Total	**205 (56.3%)**	**159 (43.7%)**	**364 (100%)**

Table 2 Completed sampling matrix 2

Current Occupation	Male	Female	**Total**
Education	52 (43.0%)	69 (57.0%)	**121 (33.2%)**
Working	91 (63.6%)	52 (36.4%)	**143 (39.3%)**
Unemployed	62 (62.0%)	38 (38.0%)	**100 (27.5%)**
Total	**205 (56.3%)**	**159 (43.7%)**	**364 (100%)**

Table P1 Variance explained from Principle Components Analyses of function items for each substance

Component	Alcohol	Cannabis	Amphet.	Ecstasy	LSD	Cocaine
1	28.48	22.6	22.54	23.49	24.26	24.41
2	7.67	8.69	10.05	10.17	13.47	10.40
3	7.24	8.49	9.50	8.59	11.99	9.36
4	6.66	7.09	7.75	7.31	9.12	7.55
5	5.79	5.86	6.45	6.31	7.56	6.61
6	5.65	5.42	5.67	6.06	5.71	5.86
7	5.33	5.33	5.36	5.55	4.87	5.25
8	4.74	5.17	4.83	5.16	4.47	5.08
9	4.31	4.45	4.45	4.41	4.06	4.54
10	3.96	4.38	3.92	4.08	3.78	4.12
11	3.75	4.06	3.69	3.92	3.16	3.51
12	3.48	3.76	3.18	3.42	2.67	2.81
13	3.41	3.52	2.97	3.09	1.91	2.72
14	3.05	3.35	2.63	2.58	1.46	2.42
15	2.72	2.86	2.49	2.24	0.97	2.05
16	2.07	2.57	2.36	1.87	0.55	1.81
17	1.71	2.36	2.17	1.76	-	1.51

Table P2 Factor loadings and Cronbach's alpha coefficients for Negative Mood Function subscale by drug.

used [substance] to ...	**Alcohol**	**Cann.**	**Amph**	**Ecstasy**	**LSD**	**Coke**
Eigenvalue (Variance %)	1.85 (61.8)	1.78 (59.3)	1.76 (58.7)	1.60 (53.4)	1.81 (60.2)	1.96 (65.4)
FEEL BETTER	0.83	0.77	0.86	0.75	0.85	0.83
STOP WORRYING	0.80	0.78	0.78	0.66	0.87	0.87
DECREASE BOREDOM	0.72	0.76	0.62	0.77	0.56	0.72
Cronbach's alpha	0.73	0.69	0.65	0.64	0.54	0.65

Table P3 Factor loadings and cronbach's alpha coefficients for Social Function subscale by drug

used [substance] to ...	**Alcohol**	**Cann.**	**Amph**	**Ecstasy**	**LSD**	**Coke**
Eigenvalue (Variance %)	1.85 (46.3)	1.90 (38.0)	1.93 (48.1)	2.37 (47.4)	1.67 (55.6)	2.22 (44.4)
ENJOY COMPANY	0.63	0.58	0.65	0.67	0.74	0.65
INCREASE CONFIDENCE	0.75	0.71	0.74	0.67	-	0.72
LOSE INHIBITIONS	0.76	0.58	0.74	0.81	0.77	0.71
KEEP GOING	0.56	0.52	0.63	0.63	-	0.71
ENHANCE ACTIVITY	-	0.67	-	0.65	0.73	0.52
Cronbach's alpha	0.60	0.58	0.64	0.72	0.59	0.68

Table P4 Correlations between additional function items for alcohol (n=312)

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. ENHANCE SEX									
2. INTOXICATED	0.247***								
3. ELATED/EUPHORIC	0.182***	0.237***							
4. RELAX	0.213***	0.260***	0.328***						
5. STAY AWAKE	0.151**	0.140*	0.195***	0.120*					
6. SLEEP	0.045	0.151**	0.229***	0.340***	0.087				
7. WORK	0.082	0.095	0.123*	0.159**	0.040	0.180***			
8. LOSE WEIGHT	-	-	-	-	-	-	-		
9. IMPROVE EFFECTS	0.162**	0.266***	0.193***	0.217***	0.202***	0.215***	0.080	-	
10. AFTER EFFECTS	0.118*	0.224***	0.186***	0.323***	0.118*	0.276***	0.060	-	0.380***

Table P5 Correlations between additional function items for cannabis (n=345)

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. ENHANCE SEX									
2. INTOXICATED	0.194***								
3. ELATED/EUPHORIC	0.102	0.064							
4. RELAX	0.117*	0.249***	0.034						
5. STAY AWAKE	0.083	-0.031	0.107*	0.035					
6. SLEEP	0.163**	0.173***	0.089	0.300***	0.035				
7. WORK	0.143**	0.005	0.152**	0.101	0.269***	0.185***			
8. LOSE WEIGHT	-0.015	0.027	0.039	0.046	-0.032	0.104	-0.012		
9. IMPROVE EFFECTS	0.211***	0.084	0.174***	0.092	0.084	0.235***	0.297***	0.061	
10. AFTER EFFECTS	0.153**	0.076	0.068	0.159**	0.060	0.226***	0.185***	0.075	0.482***

Table P6 Correlations between additional function items for amphetamines (n=165)

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. ENHANCE SEX									
2. INTOXICATED	0.176*								
3. ELATED/EUPHORIC	0.043	0.266***							
4. RELAX	0.177*	0.184*	0.120						
5. STAY AWAKE	0.171*	0.279***	0.247***	-0.009					
6. SLEEP	-	-	-	-	-				
7. WORK	0.141	0.080	-0.057	-0.027	0.068	-			
8. LOSE WEIGHT	0.014	-0.009	0.033	0.186*	-0.022	-	0.105		
9. IMPROVE EFFECTS	0.069	0.294***	0.100	0.088	0.167*	-	0.055	-0.061	
10. AFTER EFFECTS	0.139	0.252***	-0.086	0.181*	0.081	-	0.275***	0.019	0.300***

Table P7 Correlations between additional function items for ecstasy (n=166)

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. ENHANCE SEX									
2. INTOXICATED	0.044								
3. ELATED/EUPHORIC	0.036	0.106							
4. RELAX	0.125	0.135	0.143						
5. STAY AWAKE	0.157*	0.142	0.322***	0.170*					
6. SLEEP	-	-	-	-	-				
7. WORK	-0.021	0.007	-0.011	0.027	0.006	-			
8. LOSE WEIGHT	0.125	0.038	-0.097	0.084	-0.187*	-	0.048		
9. IMPROVE EFFECTS	0.129	0.225**	0.058	0.210**	0.165	-	0.163*	0.086	
10. AFTER EFFECTS	0.179*	0.110	-0.037	0.00	-0.033	-	0.300***	0.075	0.332***

Table P8 Correlations between additional function items for LSD (n=62)

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. ENHANCE SEX									
2. INTOXICATED	0.186								
3. ELATED/EUPHORIC	0.044	0.392**							
4. RELAX	0.056	0.095	0.221						
5. STAY AWAKE	0.368**	0.340**	0.404***	0.146					
6. SLEEP	-	-	-	-	-				
7. WORK	0.243	0.121	0.130	0.205	0.094	-			
8. LOSE WEIGHT	-	-	-	-	-	-	-		
9. IMPROVE EFFECTS	0.458***	0.140	0.213	0.102	0.208	-	0.323*	-	
10. AFTER EFFECTS	0.259*	0.164	0.176	0.220	0.127	-	0.893***	-	0.318*

Table P9 Correlations between additional function items for cocaine (n=172)

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. ENHANCE SEX									
2. INTOXICATED	0.300***								
3. ELATED/EUPHORIC	0.034	0.161*							
4. RELAX	0.159*	0.261***	0.092						
5. STAY AWAKE	0.152*	-0.001	0.214**	-0.042					
6. SLEEP	-	-	-	-	-				
7. WORK	0.000	0.092	0.104	0.257***	0.121	-			
8. LOSE WEIGHT	0.152*	0.173*	0.098	0.217**	0.062	-	0.268***		
9. IMPROVE EFFECTS	0.103	0.219**	0.202**	0.303***	0.030	-	0.107	-0.077	
10. AFTER EFFECTS	0.128	0.199**	0.032	0.132	0.070	-	0.308***	0.090	0.209**

Table P10 Factor loadings and cronbach's alpha coefficients for seven-item problem scale by substance

How often have you ...	***Cann (n=345)***	***Amph (n=165)***	***XTC (n=166)***	***LSD (n=62)***	***Coke (n=172)***	***Alc (n=312)***
Eigenvalue (Variance %)	2.59 (37.0)	3.64 (52.0)	3.49 (50.0)	3.22 (46.0)	3.79 (54.1)	3.75 (53.5)
Have you been pre-occupied by thoughts about using [drug]?	0.50	0.70	0.70	0.68	0.75	0.73
Have you been worried or concerned about your [drug] use?	0.57	0.72	0.70	0.70	0.76	0.70
Has your [drug] use led to problems with family, friends, work etc.	0.70	0.82	0.80	0.77	0.78	0.78
Have you prioritised spending money on [drug] over other things?	0.55	0.68	0.70	0.68	0.69	0.75
Has your use of [drug] led you to neglect what was normally expected of you?	0.79	0.78	0.75	0.80	0.76	0.79
Have you regretted what you did when you were high or intoxicated on [drug]	0.57	0.66	0.60	0.53	0.69	0.71
Have you used more [drug] than you intended to?	0.53	0.68	0.67	0.54	0.72	0.66
Cronbach's alpha	0.70	0.84	0.82	0.78	0.85	0.85

Table P11 Factor loadings and Cronbach's alpha coefficients for 4-item scale for negative effects from substance use in the past year

How often have you ...	**Alcohol (n=312)**	**Cann (n=345)**	**Amph (n=165)**	**Ecstasy (n=166)**	**LSD (n=62)**	**Cocaine (n=172)**
Eigenvalue (Variance %)	1.91 (47.7)	1.61 (40.3)	1.99 (49.8)	2.02 (50.5)	2.42 (60.4)	2.20 (55.1)
Felt sick or unwell as a result of your use?	0.74	0.73	0.74	0.75	0.78	0.68
Wished that the effects of [substance] would reduce or stop?	0.75	0.51	0.78	0.75	0.83	0.78
Felt anxious or nervous as a result of using [substance]?	0.60	0.66	0.74	0.70	0.82	0.78
Had an accident or took unnecessary risks as a result of using [substance]?	0.66	0.62	0.53	0.64	0.68	0.72
Cronbach's alpha	0.63	0.65	0.66	0.67	0.78	0.72

Table P12 Summary of composite measure of intensity of use in past 90 days (frequency of use x amount) by gender

	Males	*Females*	*Total (s.d; range)*	*t-test*
Alcohol (n=327)	494[c]	331[c]	418[c] (481; 0-2700)	3.16**
Cannabis (n=350)	136[a]	102[a]	119[a] (116; 0-410)	2.72**
Amphetamines (n=188)	6.69[a]	8.33[a]	7.45[a] (10.9; 0.04-78.0)	-0.912
Ecstasy (n=177)	19.5[b]	19.2[b]	19.4[b] (31.0; 0.5-166)	0.043
LSD (n=91)	6.94[b]	6.13[b]	6.69[b] (10.6; 0.5-58.5)	0.237
Cocaine (n=184)	12.9[a]	9.00[a]	11.0[a] (18.2; 0.01-113)	1.35

[a] = total grams; [b] = total number of tabs/tablets; [c] = total number of units

Appendix Q

Drug and Alcohol Review (2000) 19, 181–190

Drug use functions predict cocaine-related problems in young people

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Abstract

Over the last decade, concern about young people and stimulant drugs has primarily focused on the use of amphetamines and ecstasy. In the United Kingdom, this concern has recently expanded to include the use of cocaine hydrochloride (powder cocaine). This study examined patterns of illicit substance use, with a particular focus on cocaine consumption, among a sample of 364 young drug users aged between 16 and 22 years. The sample was recruited using snowballing methods and respondents were interviewed in informal settings by peer interviewers. Over half the sample reported lifetime use of powder cocaine and just over 40% of these had used crack cocaine. A seven-item scale was used to measure cocaine-related problems. The three most common problems endorsed by the cocaine users were *impaired control*, '*prioritizing spending money on cocaine over other things*' and being *pre-occupied with using*. In a multiple regression analysis, 50% of the variance in cocaine-related problem scores was predicted by the perceived functions for cocaine use, the number of times of lifetime cocaine use and the total number of days of recent stimulant use. Use of cocaine to alleviate depressed state or negative mood was the most powerful predictor of cocaine problems. The inclusion of a functional appraisal component could be usefully incorporated in further research studies and in service assessment protocols for young people. [Boys A, Marsden J, Griffiths P, Strang J. Drug use functions predict cocaine-related problems in young people. *Drug Alcohol Rev* 2000; 19:181–190]

Key words: young people, cocaine, drug use problems, drug use functions.

Introduction

The United Kingdom, in common with many other European countries [1], has seen a widespread growth in drug use among young people. Population surveys in the United Kingdom [2–4] and smaller-scale surveys of young people recruited at dance events [5] or by snowballing and key informant methodologies [6,7] have provided valuable data on patterns of illicit substance use. For example, the 1998 British Crime Survey reported that among two young age bands (16–19-year-olds and 20–24-year-olds) the most popular drugs to have ever been used were cannabis (ever used by 40% of the younger and 47%

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of the older age band), followed by amphetamine sulphate (18% and 24%), LSD (10% and 13%) and then ecstasy (8% and 12%). Levels of cocaine hydrochloride use among the two groups were found to be 3% and 9%, respectively [2].

In contrast to these population prevalence estimates, substantially elevated figures have been reported by smaller-scale non-random studies of specific groups. A survey commissioned by the voluntary organization 'Release' found high levels of illicit drug use among its sample of 517 dance event attendees [5]: lifetime prevalence of cannabis use was 95%, followed by ecstasy (85%), amphetamine sulphate (84%) and LSD (78%). Cocaine hydrochloride had been used by 62% of respondents and crack cocaine by 18%. In their qualitative study of 50 young drug and alcohol users aged 16–21, Boys *et al.* [7] found a similar profile of lifetime substance use. Cannabis had been used by 94% of the sample and amphetamine sulphate by 70%. These were followed by ecstasy (54%), LSD (42%) and cocaine hydrochloride (32%).

A substantial body of research has examined patterns of cocaine powder consumption among users in Europe, Australia and North America (e.g. [9–11]). In general, these studies have described the typical cocaine powder user as single, in their mid–20s and better-educated than average. Users under the age of 20 years have been reported to be extremely rare [10, 12] and, in general, controlled use of cocaine powder has been described as the norm, with only a minority developing problems associated with their use [13]. However, little is known about the reasons why young people are attracted to using cocaine, their patterns of use or associated negative consequences.

Our recent work has focused on the reasons and motivations for drug use by young people. A particular interest has been in exploring the specific 'function' which an individual perceives that the consumption of a substance serves. Drug use functions may prove helpful in trying to make sense of polysubstance use and how decisions are made about patterns of consumption [6–8]. Preliminary work in this area has suggested that both mood-altering and social functions for use of amphetamine sulphate, ecstasy, cannabis and alcohol are useful predictors when modelling intentions to use these drugs again in the future [6]. However, to date, the predictive power of substance use functions has not been tested in models of substance-related problems.

Research into polysubstance use among non-treatment recruited samples of young people is important if we are to increase our understanding of patterns of polysubstance use and how problems with use develop among this population. Such information could be critical in helping us to predict emerging problems and to develop more effective prevention and intervention services. In this paper, we use data from a study of young polydrug users recruited in London to profile patterns of cocaine use and to explore links between perceived functions for cocaine use and cocaine-related problems.

Methods

The primary aim of the study was to examine patterns of substance use among a sample of regular polydrug users who did not have any history of contact with treatment services for drug misuse. In order to ensure adequate coverage of the target population, we used a structured snowball sampling approach. The age, gender and occupation of subjects were monitored carefully to ensure an even spread of demographic characteristics across the sample. Accessing hidden populations of drug misusers poses specific challenges. Snowball sampling is considered to be an effective way of generating a large sample from a hidden population where no formal sampling frame is available [14] and there is a history of success with this method in enabling access to drug users (e.g. [15,16]). However, its shortfall is that the sample obtained is not random and so the results must be interpreted with care. Nevertheless, the snowball sample has distinct advantages over alternative, more limited ethnographic approaches: it allows theories and models to be tested quantitatively on sizeable numbers of subjects who have engaged in a relatively rare behaviour.

The sample

Eligibility criteria for inclusion in the study were as follows: aged between 16 and 22 and use of two or more illegal substances in the 90 days prior to interview. In the United Kingdom, policy planning tends to define 'young people' (although definitions vary) as under 25. Study resources meant that in order to achieve sufficient cell sizes for analyses by age, the age range needed to be restricted. We therefore divided this range into four groups (16–17, 18–19, 20–22 and 23–24 years) and decided to focus on the lower bands. Given that previous studies have reported average ages of first use of cocaine of between 19 and 22 years [9–11], we specifically included respondents up to the age of 22. This enabled us to ensure that the data could be analysed meaningfully by age.

Individuals who had received treatment for a substance-related problem were excluded from the study. The age, gender and current occupation of respondents were closely monitored throughout data collection to ensure that sufficient individuals were recruited to the groups to allow subgroup analyses. If an imbalance was observed in one of these variables, the interviewers were instructed to target specific types of respondent (for example, females under the age of 18) until the sample became more evenly balanced.

The interviewers

A team of 20 Privileged Access Interviewers or 'peer-access interviewers' (PAIs) were employed to recruit and interview their eligible drug-using peers. The use of PAIs has been described as a useful method for collecting large quantitative datasets from hidden populations [17]. The PAIs received an initial day's training (6 hours) in interviewing skills and use of the research instrument. This process then continued throughout the study. When additional training needs were identified from debriefing sessions and through checking the completed questionnaires, further training was provided.

The average age of the interviewers was 23 years (median = 22, mode = 22). Fourteen (70.0%) described their ethnic origin as 'white European', three were black and three Asian. Eight were in full-time education, just under a third had part-time work, three were in full-time employment and two were formally unemployed at the time of training. Half the interviewers had left school at age 16 or under, three at age 17 and the remainder at 18 years old.

Data collection

Data collection took place between August and November 1998. All interviews were taped with the interviewee's consent and subjected to rigorous checking and cross-validation by research staff to ensure that the research protocol was adhered to.

Data were collected by means of a structured interviewer-administered questionnaire of approximately 1 hour's duration. This examined lifetime illicit substance use in addition to profiling consumption patterns of six substances in detail (alcohol, cannabis, amphetamine sulphate, LSD, ecstasy and cocaine hydrochloride). Measures of lifetime use, consumption in the past year and in the past 90 days were included based on procedures developed by Marsden *et al* [18]. Intensity of consumption was recorded verbatim and then translated into standardized units at the data entry stage. The units used were number of tablets for LSD and ecstasy, standard units for alcohol, and grams for cannabis, amphetamine sulphate and cocaine hydrochloride.

Problem measures

The questionnaire included seven items designed to measure the frequency of experiencing problems associated with cocaine use over the year prior to interview. There are currently no existing validated screening questionnaires that have been developed for use with adolescent substance users in the United Kingdom. Alternatives developed in the United States were considered, but judged to be unsuitable. We therefore selected measures from a pool of items adapted from the World Health Organization's *International Classification of Diseases* (ICD–10) [19] and the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) [20]. Items relating solely to dependence were omitted as they were judged to be inappropriate. Instead a set of measures was selected to assess the incidence of early signs of problematic substance use. These addressed seven dimensions: preoccupation with use; worry about use, social problems; prioritizing spending money on drugs over other things; role neglect, feeling guilty after using, and perceived loss of control. Each item was scored on a five-point 'never' to 'always' (scoring 0–4, respectively) scale. These were then summed to yield an overall 'recent problem score'.

Functions for use

The questionnaire also included a series of items designed to measure perceived functions for drug use (defined as the specific purpose for using a particular substance). This consisted of items developed in previous work by the authors [6] together with additional functions derived from qualitative interviews [7], new literature and informal discussions with young drug users. A total of 15 functional statements were included in the final questionnaire spanning four domains: using to change mood, using for specific physical effects, using for social purposes and using to facilitate an activity. Each item had two parts: first, the

respondent was asked if they had *ever* used the drug in order to fulfil the particular function. Those who endorsed the item were then invited to rate how frequently they had used for this purpose in the past year using the same five-point 'never' to 'always' scale as was used for the problem items. Scores for each item were then summed to give an overall function score for the last 12 months (maximum possible score = 60). We believe that use of a particular drug often fulfils multiple functions for the users and so the overall 'function score' reflects the number and frequency of using the drug for different functions.

Analytical methods

Proportions and means in the data set were analysed using χ^2 and *t*-tests, respectively Predictors of cocaine-related problem scores were explored using multiple regression analyses with backwards elimination of covariates.

Results

The results section is organized into four sections: (i) description of the study sample, (ii) characteristics of the young cocaine users, (iii) perceived functions for cocaine use and (iv) problems associated with cocaine use.

Table 1. *Descriptive characteristics of the study population (n = 364)*

Variable	Frequency	Percentage
Age (years)		
16–17	75	20 6
18–19	119	32.7
20–22	170	46 7
Ethnicity		
White European	254	69 8
Black	46	12 6
Asian	37	10.1
Other	27	7.4
Occupation		
Unemployed	100	27.5
Full-time education	105	28 8
Part-time education	16	4.4
Full-time work	105	28 8
Part-time work	38	10 4
Monthly disposable income[1]		
£0–100	90	24.7
£101–200	92	25.3
£201–400	100	27.4
£401–600	51	14 0
£600 +	31	8 5

[1] Disposable income was defined as any money that was spare after paying for rent, bills and food.

(i) Description of the study sample

The sample consisted of 364 young people (205 males) with a mean age of 19.3 years (SD 1.9). The sample demographics are summarized in Table 1.

Substance use history. The drug with the highest prevalence of prior use among the sample was cannabis (96%). This lead position for cannabis is in line with current population prevalence figures for drug use in the United Kingdom [2–4]. This was followed by amphetamine sulphate (52%), cocaine hydrochloride (51%) (referred to as cocaine hereafter) and ecstasy (49%) Table 2 summarizes the lifetime substance use history for the total sample.

There were no gender differences observed for lifetime use of any drug type with the exception of LSD. Here the prevalence was 31% for male respondents and 17% for females ($\chi^2_{[1]} = 9\,68, p = 0.002$).

Only 52 (14%) of the sample reported that they had used all three of the recorded stimulants (amphetamine sulphate, ecstasy and cocaine) and 80 (22%) had used cocaine only. Figure 1 illustrates the distribution of lifetime stimulant use throughout the total sample. The remainder of the present analyses focus on the subsample of 184 cocaine users of whom 80 had used cocaine only, 23 had used cocaine and amphetamine sulphate only, 29 had used cocaine and ecstasy only and 52 had used all three stimulants.

(ii) Characteristics of the young cocaine users (n = 184)

Overall the demographics of the cocaine users were very similar to the remainder of the sample. There were no significant differences in terms of age ($t_{[362]} = 0.70, p = 0.48$), gender ($\chi^2_{[1]} = 1.41, p = 0.23$), ethnicity ($\chi^2_{[4]} = 1\,38, p = 0.71$) or current occupation ($\chi^2_{[4]} = 5.88, p = 0\,21$). Those in the sample who had been excluded from school were no more likely to have used cocaine ($\chi^2_{[1]} = 1.05, p = 0.31$) nor was any relationship observed with school performance ($t_{[356]} = 0.09, p = 0.93$) level of qualifications obtained ($\chi^2_{[5]} = 0\,60, p = 0.99$) or estimated monthly disposable income.

Additional substance use. The total number of drugs used by those who had tried cocaine ranged from 2 to 16 with a mean of 6.8 (median = 6 0; mode = 5.0). The vast majority of the cocaine users (174, 94 6%) had used cannabis, 44 0% (81) had used ecstasy; 40 8% (75) amphetamine sulphate and 28 8% (53) LSD. Other drugs reportedly used by this group included crack cocaine (75, 40 8%), inhalants (85, 46 2%), tranquillizers (47, 25 5%) and heroin (26, 14.1%). Five respondents reported that they had used a drug intravenously at some point in their lives.

Table 2. *Lifetime prevalence of substance use (n = 364)*

Substance	Male (%) (n = 205)	Female (%) (n = 159)	Total (%) (n = 364)	χ^2	*p*
Cannabis	96	96	96	0 004	0 95
Amphetamine sulphate	53	50	52	0 201	0 65
Ecstasy	50	47	49	0 240	0 62
Cocaine HCl	48	54	51	1 414	0 23
LSD	31	17	25	9 682	0 002**
Crack cocaine	23	28	26	1 124	0 29
Magic mushrooms	10	5	8	3 318	0 07
Tranx	21	23	22	0 146	0 70
Heroin	15	9	12	2 863	0 91
Inhalants*	45	40	43	0 783	0 38

*Category includes amyl/butyl nitrites, solvent, gases and fuels

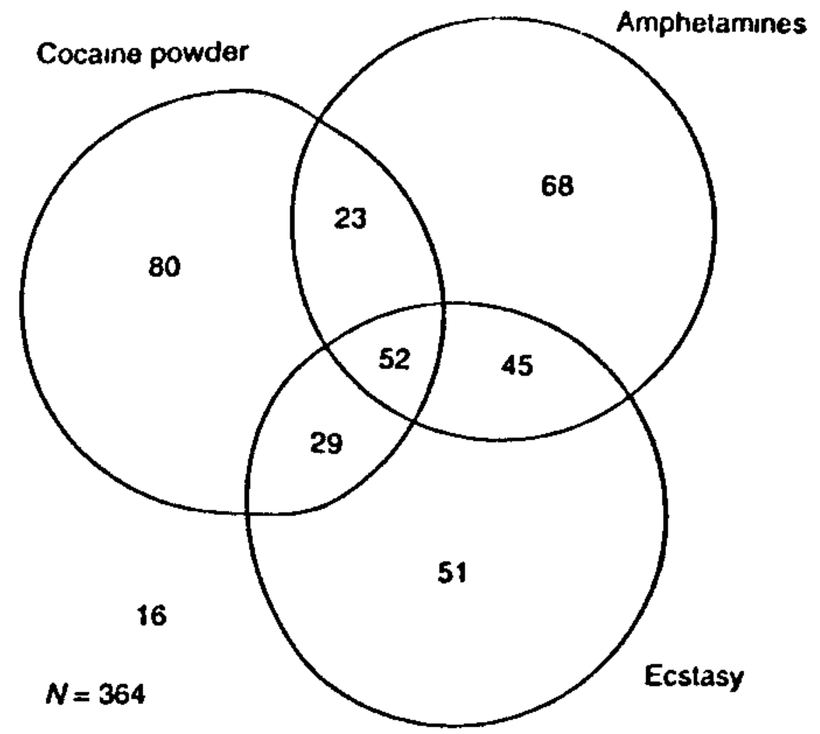

Figure 1. *Lifetime use of recorded stimulants. amphetamine sulphate, ecstasy and cocaine.*

History of cocaine use. The average age for first use of cocaine was 17 years (range = 12–22 years, median = 17, mode = 16) There were no differences in age of initiation observed by gender ($t_{[182]} = 0.70, p = 0.48$).

Respondents were asked to estimate the total number of separate occasions on which they had used cocaine by choosing from a six-point categorical scale (once, 2–10 times, 11–20 times, 21–50 times, 51–100 times, over 100 times). Seven of the sample group reported that they had only used cocaine on one occasion. These were excluded from the regression analyses. However, the majority of the sample (134, 74.4%) estimated that they had used the drug on more than 10 occasions: almost a quarter (43, 23.4%) on 21–50 occasions, 36 (14.1%) on 51–100 occasions and a further 31 (16.8%) had used it over 100 times. The estimated maximum amount of cocaine ever consumed in 24 hours ranged from 0.14 g to 7.1 g (a quarter of an ounce) with a mean of 1.51 g.

Current patterns of cocaine consumption. For 'last year' use, the most common route for cocaine consumption was by snorting (93%). Other users had either mainly smoked (4.2%) or swallowed it (2.4%). Over 90% of those who had tried cocaine had also used it within the 3 months prior to interview. These were defined as 'current users' and had used cocaine on an average of 11.3 days out of the past 90 (median = 6.0, mode = 9; range 0–80). However, less than 5% had typically used cocaine on more than 3 days per week. On average, respondents reported using just under one gram on a typical using day (range 0.01–3.5 g).

(iii) Perceived functions for cocaine use

Participants were asked to indicate which of a list of 15 different functions they had ever intended their cocaine use to fulfil. The total number of different functions endorsed ranged from 0 to 15 with a mean of 7.7 (median = 8.0; mode = 9.0). The most frequently reported functions for cocaine use were 'to help you keep going on a night out with friends' followed by 'to get really stoned or intoxicated', 'to help you to stay awake' and 'to help you to feel more confident or more able to talk to people in a social situation'. Table 3 summarizes these responses and includes χ^2 values to identify where significant differences were found between male and female respondents.

Table 3. *Lifetime frequency of using cocaine for specific functions (n = 184)*

Used cocaine to	Male (%) (n = 98)	Female (%) (n = 86)	Total % (n = 184)	χ^2
1. Make yourself feel better when down or depressed	51.0	65.1	57.6	3.73
2. Help you keep going on a night out with friends	81.6	84.9	83.2	0.36
3. Help you feel elated or euphoric	64.3	50.0	57.6	3.83*
4. Get really stoned or intoxicated	71.4	65.1	68.5	0.85
5. Help you lose weight	0	11.6	5.4	12.05***
6. Help you enjoy the company of your friends	52.0	67.4	59.2	4.50*
7. Help you to relax	27.6	25.6	26.6	0.09
8. Help you feel more confident or more able to talk to people in a social situation	60.2	72.1	65.8	2.88
9. Help you to stay awake	57.1	76.7	66.3	7.88**
10. Help you lose your inhibitions	31.6	51.2	40.8	7.24**
11. Enhance feelings when having sex	49.0	54.7	51.6	0.59
12. Help you to stop worrying about a problem	28.6	51.2	39.1	9.81**
13. Help make something you were doing less boring	45.9	53.5	49.5	1.05
14. Help you to concentrate or to work or study	5.1	7.0	6.0	0.29
15. Enhance an activity such as listening to music or playing a game or sport	64.3	55.8	60.3	1.37

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Gender differences were observed for the lifetime endorsement of six different functions: using cocaine 'to help you to feel elated or euphoric' ($\chi^2_{[1]} = 3.83$, $p = 0.05$); 'to help you to lose weight' ($\chi^2_{[1]} = 12.05$, $p = 0.0005$); 'to help you to enjoy the company of your friends' ($\chi^2_{[1]} = 4.50, p = 0.034$); 'to help you to stay awake' ($\chi^2_{[1]} = 7.88$, $p = 0.005$); 'to help you lose your inhibitions' ($\chi^2_{[1]} = 7.23$, $p = 0.007$) and 'to help you to stop worrying about a problem' ($\chi^2_{[1]} = 9.81$, $p = 0.002$). With the exception of using cocaine 'to help you feel elated or euphoric', each of these functions was more popular with females than with male respondents.

Overall functions scores ranged from 0 to 52 (the maximum possible score was 60). The mean score on this scale was 18.0, the median 19.0 and the standard deviation 9.2. The internal reliability for this 15-item scale was satisfactory (Chronbach's $\alpha = 0.78$).

(iv) Problems associated with cocaine use

The three most common problems endorsed by the sample were *impaired control* (67.1%), *'prioritising spending money on cocaine over other things'* (66.7%) and being *pre-occupied with using* (66.1%). Chronbach's α for the seven-item problem scale was 0.85. Scores ranged from 0 to 24 (the maximum possible score was 28) with an average of 6.9 (95% CI 6.1–7.8).

Predicting cocaine-related problems. A multiple regression analysis with backwards elimination of covariates was performed to predict scores on the cocaine problem scale. The covariates used were as follows: age, sex, amount of disposable income, stimulant use history, current frequency of stimulant use, cannabis use, and alcohol use, and scores on the functions scale. The cases-to-covariates ratio for these analyses was 14 : 1, which exceeded the minimum ratio considered acceptable for multiple regression analysis [21]. No multicolinearity was observed between independent variables; no cases had missing data and no supressor variables were detected. Table 4 displays the correlations between the variables in the model, unstandardized regression coefficients (B), intercept, standardized regression coefficients (β) and R^2 and adjusted R^2.

R for regression was significant ($F_{[5,162]} = 32.84$, $p < 0.000$). Forty-nine per cent of the variability in scores on the cocaine problem scale was predicted from the scores on five covariates. The three strongest predictors of cocaine-related problems were scores on the functions scale ($\beta = 0.37$), the total number of days of stimulant use (cocaine, amphetamine or ecstasy) in the last 90 days ($\beta = 0.29$) and the total number of occasions of cocaine use ever ($\beta = 0.29$). The two additional covariates in the model were lifetime use of amphetamine sulphate and the number of days of cannabis use in the past 90 days. The age and sex of participants did not make significant contributions to the regression equation, nor did the amount of monthly disposable income. Other non-significant variables included age of first use of cocaine, lifetime use of crack cocaine, lifetime use of

Table 4. *Standard multiple regression of personal demographics, drug use history, current patterns of stimulant use and perceived function scales on scores on the cocaine problems scale ($n = 168$, $F_{[5,162]} = 32.84$, $p < 0.0000$)*

Covariates	r	B	β
Age	−0.21**	−0.12	−0.01
Sex	0.01	−0.95	−0.08
Total number of occasions of cocaine use ever	0.51***	1.12	0.29***
Total days of stimulant use in past 90 days	0.43***	0.08	0.29***
Perceived functions scale	0.48***	0.22	0.37***
Total days of cannabis use in past 90 days	−0.01	−0.20	−0.13*
Lifetime use of amphetamine sulphate	−0.30***	−1.89	−0.17**
Intercept =	−0.72		
R^2 =	0.50		
Adjusted R^2 =	0.49		

*$p < 0.05$, **$p < 0.01$; ***$p < 0.001$.

Table 5. *Standard multiple regression of demographics, and perceived function scale items on cocaine problem scores (n = 168; $F_{[8,162]}$ = 21.35; p < 0.0000)*

Covariates	*R*	*B*	*β*
Age	−0.21**	−0.27	−0.07
Sex	0.01	−1.24	−0.10
'to make yourself feel better when down or depressed'	0.57***	2.30	0.48***
'to enhance feelings when having sex'	0.41***	1.15	0.30***
'to help you to stay awake'	0.21**	−0.48	−0.13
'to help you to keep going on a night out with friends'	0.33***	0.78	0.19*
'to help you to concentrate or to work or study'	0.11	1.67	0.14*
'to help you to relax'	0.04	−0.71	−0.13
Intercept =	2.06		
R^2 =	0.44		
Adjusted R^2 =	0.42		

*$p < 0.05$, **$p < 0.01$; ***$p < 0.001$.

ecstasy and the frequency of alcohol use in the past 90 days.

A further multiple regression was performed to explore the extent of association of the individual functions for cocaine use on cocaine problem scores. Each of the 15 items from the composite functions scale were entered into the equation individually along with the demographics (age, sex and monthly disposable income). The cases-to-covariates ratio for these analyses was 9.1. The regression model is summarized in Table 5.

R for regression was significant ($F_{[8,162]}$ = 21.35; $p < 0.0000$). Forty-two per cent of the variability in scores on the cocaine problem scale was predicted from the scores on six covariates. By far the strongest predictor of cocaine-related problems was using cocaine to 'make yourself feel better when down or depressed' ($\beta = 0.48$). Other functions which were found to be significant predictors in the model included: 'to enhance feelings when having sex'; 'to help you to stay awake' and 'to help you to keep going on a night out with friends'. The age and sex of participants did not make significant contributions to the regression equation, nor did the amount of monthly disposable income.

Discussion

This paper has presented data from a study of 364 polysubstance users. A striking finding from the study was the high level of reported cocaine use within the sample. Although our respondents were explicitly recruited to be regular polydrug users, we had no reason to expect any structured bias towards cocaine users in the study. Previous small-scale studies of non-treatment samples of young drug users have reported high levels of cocaine use, but significantly lower than the associated figures for use of ecstasy and amphetamine sulphate. Cocaine use has also tended to be associated with older, more experienced drug users who have already used other stimulants. The high prevalence of cocaine use found in this study equalled that of the other stimulants and was particularly unexpected as it was not confined to older respondents, nor to those who were more drug involved (i.e. have experience with illicit drugs other than cannabis). No significant differences were observed by age, gender, ethnicity, qualifications, current occupation or income between those who had and those who had not used cocaine. However, one encouraging finding was that many only used cocaine at weekends and less than 5% reported recent use on more than 3 days per week. Similar observations have been made in studies of adult powder cocaine users [12]. Nevertheless, if the use of cocaine powder is on the increase, the number of users who are likely to develop severe problems and place increasing demand on drug treatment centres may also expand in the near future. To date, there has been no systematic review within the United Kingdom of drug misuse service needs for young people and this remains a priority. Longitudinal studies are needed to plot the trajectory of cocaine use over time among this population.

A particularly worrying finding was the high prevalence of crack cocaine use among the sample. Two-fifths (41%) of those who had used cocaine reported that they had also used this drug in the form of crack. However, although this type of cocaine use has been associated with some of the most serious drug-related problems in inner city areas of the United Kingdom and United States, lifetime use of crack cocaine did not make a significant contribution to the model of cocaine problem scores. Nevertheless, the high levels of crack use observed in the sample may suggest that the boundary between cocaine and crack cocaine is becoming less well defined. Further research is needed to explore the position of these two drugs within the substance using repertoires of young drug users. More detailed data on young cocaine users will be needed to equip society to respond to changes in patterns of substance use and the associated problems which are likely to arise.

The functions that the sample endorsed for cocaine use varied widely. Those most frequently endorsed tended to be concerned with social activities ('keeping going' at night when out with friends; to get intoxicated, or stay awake, or to help feel more confident in a social situation). A recent study reported similar findings for amphetamine and ecstasy use [6]. The analysis also suggests that several of the function statements were more likely to be endorsed by females than males. However, why the female respondents were more likely to perceive use in a functional way is unclear. Certainly, if this indicates an underlying trend that female users are more likely than males to use cocaine as a social support, particularly to help them to feel less inhibited in social situations, then there could be concern that their potential risk for longer term problems may be elevated. Gender differences in how substance use patterns and problems develop remains a poorly understood area. Future studies should ensure that this issue is addressed.

The most commonly reported cocaine-related problems were impaired control, 'prioritizing spending money on cocaine over other things' and being preoccupied with thoughts about using cocaine. The latter problem is of particular concern as this reflects a symptom which is usually included in screening checklists to assess the presence of dependence. Further research is needed to assess the extent and nature of cocaine dependence among young users. The results of the regression analyses suggest that high scores on the functions scale were strongly predictive of high scores on the problem scale. Closer examination of the data revealed that the majority of the variance accounted for by scores on the function scale seemed to be explained by those who reported using cocaine to make themselves feel better when they were feeling down or depressed. In contrast, reporting use for relaxation or to help to stay awake, seemed to be associated with smaller problem scores. A tentative conclusion from these findings could be that there is a difference between using cocaine for reasons that are external to the individual compared with using to moderate internal negative psychological states (such as relieving feelings of depression). Those who report the latter purpose could be at greater risk of developing future problems associated with their use. Harm reduction and prevention initiatives which target cocaine use may be enhanced by the inclusion of an analysis of perceived functions for use.

Further research should examine if similar models can be constructed to predict problem scores relating to use of other substances. If perceived functions for substance use prove to be strong predictors of other types of substance-related problems, then it may be appropriate to target functions for use in interventions and treatment approaches for young people for all drugs. A raft of screening and assessment instruments were developed during the late 1980s and early 1990s. These are highly variable. Many of them focus on alcohol, few desegregate the different drugs and none (to our knowledge) examine individual reasons (or functions) for use of different drugs [22]. The evidence presented here, together with that from our previous work [6], suggests that the inclusion of a functional appraisal component in such a tool might be appropriate.

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References

[1] European Monitoring Centre for Drugs and Drug Addiction. Annual Report on the state of the drugs problem in the European Union. Lisbon: European Monitoring Centre for Drugs and Drug Addiction, 1998

[2] Ramsay M, Partridge S. Drug misuse declared in 1998: results from the British Crime Survey. London: Home Office, 1999.
[3] Health Education Authority/BMRB International. Drug use in England: results of the 1995 National Drugs Campaign Survey. London: Health Education Authority, 1997.
[4] Tasker T, Raw M, McNeill A, O'Muircheartaigh C, Bowden C, Heuston J. Drug realities: a summary of the key findings of the 1996 National Drugs Campaign Survey. London: Health Education Authority, 1999.
[5] Release Drugs and Dance Survey: an insight into the culture. London: Release, 1997.
[6] Boys A, Marsden J, Griffiths P, Fountain J, Stillwell G, Strang J. Substance use among young people: the relationship between perceived functions and behavioural intentions. Addiction 1999;94:1043–50.
[7] Boys A, Marsden J, Fountain J, Griffiths P, Stillwell G, Strang J. What influences young people's use of drugs? A qualitative study of decision-making. Drugs Educ Prev Policy 1999,6:373–89.
[8] Boys A, Fountain J, Marsden J, Griffiths P, Stillwell G, Strang J. Drug decisions: a qualitative study of young people, drugs and alcohol. London: Health Education Authority, 2000.
[9] Hammersley R, Ditton J. Cocaine careers in a sample of Scottish users. Addict Res 1994,2:51–69.
[10] Cohen P. Cocaine use in Amsterdam in non-deviant subcultures. Addict Res 1994,2 71–94.
[11] Mugford S. Recreational cocaine use in three Australian cities. Addict Res 1994;2:95–108.
[12] Harrison LD. Cocaine using careers in perspective. Addict Res 1994,2.1–20
[13] Drucker E, Davies J. Editorial: Cocaine. Addict Res 1994,2 i–ii.
[14] Van Meter KM. Methodological and design issues: techniques for assessing the representatives of snowball samples. In: Lambert EY, ed. The collection and interpretation of data from hidden populations. Rockville, MD: National Institute on Drug Abuse, 1990 31–3.
[15] Biernacki P. Pathways from heroin addiction: recovery without treatment. Philadelphia: Temple University Press, 1986.
[16] Ives C, Kaplan C, Korczak D, Van Meter K. Cocaine epidemiology in three European community cities. A pilot study using a snowball sampling methodology. Research report of the Cocaine Steering Group. Belgium: Health Directorate Commission of The European Communities Brussels, 1988.
[17] Griffiths P, Gossop M, Powis B, Strang J. Reaching hidden populations of drug users by privileged access interviewers: methodological and practical issues. Addiction 1993,88:1617–26.
[18] Marsden J, Gossop M, Stewart D, Best D, Farrell M, Edwards C, Lehmann P, Strang J. The Maudsley Addiction Profile (MAP): A brief instrument for assessing treatment outcome. Addiction 1998,93: 1857–1867.
[19] World Health Organization. International statistical classification of diseases and related health problems, 10th edn. Geneva: WHO, 1992.
[20] American Psychiatric Association (AMA). American Psychiatric Association diagnostic and statistical manual of mental disorders, 4th edn. Washington DC: AMA,1994.
[21] Tabachnick BG, Fidell LS. Using multivariate statistics, 2nd edn. New York: Harper Collins, 1989.
[22] Leccese M, Waldron HB. Assessing adolescent substance use: a critique of current measurement instruments. J Subst Abuse Treat 1994;11:553–63.

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Understanding reasons for drug use amongst young people: a functional perspective

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Abstract

This study uses a functional perspective to examine the reasons young people cite for using psychoactive substances. The study sample comprised 364 young poly-drug users recruited using snowball-sampling methods. Data on lifetime and recent frequency and intensity of use for alcohol, cannabis, amphetamines, ecstasy, LSD and cocaine are presented. A majority of the participants had used at least one of these six drugs to fulfil 11 of 18 measured substance use functions. The most popular functions for use were using to: relax (96.7%), become intoxicated (96.4%), keep awake at night while socializing (95.9%), enhance an activity (88.5%) and alleviate depressed mood (86.8%). Substance use functions were found to differ by age and gender. Recognition of the functions fulfilled by substance use should help health educators and prevention strategists to make health messages about drugs more relevant and appropriate to general and specific audiences. Targeting substances that are perceived to fulfil similar functions and addressing issues concerning the substitution of one substance for another may also strengthen education and prevention efforts.

Introduction

The use of illicit psychoactive substances is not a minority activity amongst young people in the UK. Results from the most recent British Crime Survey show that some 50% of young people between the ages of 16 and 24 years have used an illicit drug on at least one occasion in their lives (lifetime prevalence) (Ramsay and Partridge, 1999). Amongst 16–19 and 20–24 year olds the most prevalent drug is cannabis (used by 40% of 16–19 year olds and 47% of 20–24 year olds), followed by amphetamine sulphate (18 and 24% of the two age groups respectively), LSD (10 and 13%) and ecstasy (8 and 12%). The lifetime prevalence for cocaine hydrochloride (powder cocaine) use amongst the two age groups is 3 and 9%, respectively. Collectively, these estimates are generally comparable with other European countries (European Monitoring Centre for Drugs and Drug Addiction, 1998) and the US (Johnston *et al.*, 1997, 2000).

The widespread concern about the use of illicit drugs is reflected by its high status on health, educational and political agendas in many countries. The UK Government's 10-year national strategy on drug misuse identifies young people as a critical priority group for prevention and treatment interventions (*Tackling Drugs to Build a Better Britain*, 1998). If strategies to reduce the use of drugs and associated harms amongst the younger population are to be developed, particularly within the health education arena, it is vital that we improve our understanding of the roles that both licit and illicit substances play in the lives of young people. The tendency for educators, practitioners and policy makers to address licit drugs (such as alcohol) separately from illegal drugs may be unhelpful. This is partly because young illicit drug users frequently drink alcohol, and may have little

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regard for the illicit and licit distinction established by the law. To understand the roles that drug and alcohol use play in contemporary youth culture, it is necessary to examine the most frequently used psychoactive substances as a set.

It is commonplace for young drug users to use several different psychoactive substances. The terms 'poly-drug' or 'multiple drug' use have been used to describe this behaviour although their exact definitions vary. The term 'poly-drug use' is often used to describe the use of two or more drugs during a particular time period (e.g. over the last month or year). This is the definition used within the current paper. However, poly-drug use could also characterize the use of two or more psychoactive substances so that their effects are experienced simultaneously. We have used the term 'concurrent drug use' to denote this pattern of potentially more risky and harmful drug use (Boys *et al.*, 2000a). Previous studies have reported that users often use drugs concurrently to improve the effects of another drug or to help manage its negative effects [e.g. (Power *et al.*, 1996; Wibberley and Price, 2000; Boys *et al.*, 2000a)].

The most recent British Crime Survey found that 5% of 16–29 year olds had used more than one drug in the last month (Ramsay and Partridge, 1999). Given that 16% of this age band reported drug use in the month prior to interview, this suggests that just under a third of these individuals had used more than one illicit substance during this time period. With alcohol included, the prevalence of poly-drug use is likely to be much higher.

There is a substantial body of literature on the reasons or motivations that people cite for using alcohol, particularly amongst adult populations. For example, research on heavy drinkers suggested that alcohol use is related to multiple functions for use (Edwards *et al.*, 1972; Sadava, 1975). Similarly, research with a focus on young people has sought to identify motives for illicit drug use. There is evidence that for many young people, the decision to use a drug is based on a rational appraisal process, rather than a passive reaction to the context in which a substance is available (Boys *et al.*, 2000a; Wibberley and Price, 2000). Reported reasons vary from quite broad statements (e.g. to feel better) to more specific functions for use (e.g. to increase self-confidence). However, much of this literature focuses on 'drugs' as a generic concept and makes little distinction between different types of illicit substances [e.g. (Carman, 1979; Butler *et al.*, 1981; Newcomb *et al.*, 1988; Cato, 1992; McKay *et al.*, 1992)]. Given the diverse effects that different drugs have on the user, it might be proposed that reasons for use will closely mirror these differences. Thus stimulant drugs (such as amphetamines, ecstasy or cocaine) will be used for reasons relating to increased nervous system arousal and drugs with sedative effects (such as alcohol or cannabis), with nervous system depression. The present study therefore selected a range of drugs commonly used by young people with stimulant, sedative or hallucinogenic effects to examine this issue further.

The phrase 'instrumental drug use' has been used to denote drug use for reasons specifically linked to a drug's effects (WHO, 1997). Examples of the instrumental use of amphetamine-type stimulants include vehicle drivers who report using to improve concentration and relieve tiredness, and people who want to lose weight (particularly young women), using these drugs to curb their appetite. However, the term 'instrumental substance use' seems to be used when specific physical effects of a drug are exploited and does not encompass use for more subtle social or psychological purposes which may also be cited by users. In recent reports we have described a 'drug use functions' model to help understand poly-substance use phenomenology amongst young people and how decisions are made about patterns of consumption (Boys *et al.*, 1999a,b; 2000a). The term 'function' is intended to characterize the primary or multiple reasons for, or purpose served by, the use of a particular substance in terms of the actual gains that the user perceives that they will attain. In the early, 1970s Sadava suggested that functions were a useful means of understanding how personality and environmental variables impacted on patterns of drug use (Sadava, 1975). This work was confined to functions for cannabis and 'psychedelic drugs' amongst a sample of college students. To date there has been little research that has examined the different functions associated with the range of psychoactive substances commonly used by young poly-drug users. It is unclear if all drugs with similar physical effects are used for similar purposes, or if other more subtle social or psychological dimensions to use are influential. Work in this area will help to increase understanding of the different roles played by psychoactive substances in the lives of young people, and thus facilitate health, educational and policy responses to this issue.

Previous work has suggested that the perceived functions served by the use of a drug predict the likelihood of future consumption (Boys *et al.*, 1999a). The present study aims to develop this work further by examining the functional profiles of six substances commonly used by young people in the UK.

Methods

Patterns of cannabis, amphetamine, ecstasy, LSD, cocaine hydrochloride and alcohol use were examined amongst a sample of young poly-drug users. Tobacco use was not addressed in the present research.

Sampling and recruitment

A snowball-sampling approach was employed for recruitment of participants. Snowball sampling is an effective way of generating a large sample from a hidden population where no formal sampling frame is available (Van Meter, 1990). A team of peer interviewers was trained to recruit and interview participants for the study. We have described this procedure in detail elsewhere and only essential features are described here (Boys *et al.*, 2000b). Using current or ex-drug users to gather data from hidden populations of drug using adults has been found to be successful (Griffiths *et al.*, 1993; Power, 1995).

Study participants

Study participants were current poly-substance users with no history of treatment for substance-related disorders. We excluded people with a treatment history on the assumption that young people who have had substance-related problems requiring treatment represent a different group from the general population of young drug users. Inclusion criteria were: aged 16–22 years and having used two or more illegal substances during the past 90 days. During data collection, the age, gender and current occupation of participants were recorded and monitored to ensure that sufficient individuals were recruited to the groups to permit subgroup analyses. If an imbalance was observed in one of these variables, the interviewers were instructed to target participants with specific characteristics (e.g. females under the age of 18) to redress this imbalance.

Study measures

Data were collected using a structured interviewer-administered questionnaire developed specifically for the study. In addition to recording lifetime substance use, questions profiled consumption patterns of six substances in detail. Data were collected between August and November 1998. Interviews were audiotaped with the interviewee's consent. This enabled research staff to verify that answers had been accurately recorded on the questionnaire and that the interview had been conducted in accordance with the research protocol. Research staff also checked for consistency across different question items (e.g. the total number of days of drug use in the past 90 days should equal or exceed the number of days of cannabis use during the same time period). On the few occasions where inconsistencies were identified that could not be corrected from the tape, the interviewer was asked to re-contact the interviewee to verify the data.

Measures of lifetime use, consumption in the past year and past 90 days were based on procedures developed by Marsden *et al.* (Marsden *et al.*, 1998). Estimated intensity of consumption (amount used on a typical using day) was recorded verbatim and then translated into standardized units at the data entry stage.

Table I. *Structure of functions scales*

Domain	Item
Changing mood	Make yourself feel better when down or depressed
	Help you stop worrying about a problem
	Help you to relax
	Help you feel elated or euphoric
	Just get really stoned or intoxicated
Physical effects	Enhance feelings when having sex
	Help you to stay awake
	Help you lose weight
	Help you to sleep
Social purposes	Help you enjoy the company of your friends
	Help you feel more confident or more able to talk to people in a social situation
	Help you lose your inhibitions
	Help you keep going on a night out with friends
Facilitate activity	Help you to concentrate or to work or study
	Enhance an activity such as listening to music or playing a game or sport
	Help make something you were doing less boring
Manage effects from other substances	Improve the effects of other substances
	Help ease the after effects of other substances

Functions for substance use scale

The questionnaire included a 17-item scale designed to measure perceived functions for substance use. This scale consisted of items developed in previous work (Boys *et al.*, 1999a) in addition to functions derived from qualitative interviews (Boys *et al.*, 1999b), new literature and informal discussions with young drug users. Items were drawn from five domains (Table I).

Participants were asked if they had ever used a particular drug in order to fulfil each specific function. Those who endorsed the item were then invited to rate how frequently they had used it for this purpose over the past year, using a five-point Likert-type scale ('never' to 'always'; coded 0–4). One item differed between the function scales used for the stimulant drugs and for alcohol and cannabis. For the stimulant drugs (amphetamines, cocaine and ecstasy) the item 'have you ever used [named drug] to help you to lose weight' was used, for cannabis and alcohol this item was replaced with 'have you ever used [drug] to help you to sleep?'. (The items written in full as they appeared in the questionnaire are shown in Table III, together with abbreviations used in this paper.)

Statistical procedures

The internal reliability of the substance use functions scales for each of the six substances was judged using Chronbach's α coefficient. Chronbach's α is a statistic that reflects the extent to which each item in a measurement scale is associated with other items. Technically it is the average of correlations between all possible comparisons of the scale items that are divided into two halves. An α coefficient for a scale can range from 0 (no internal reliability) to 1 (complete reliability). Analyses of categorical variables were performed using χ^2 statistic. Differences in scale means were assessed using *t*-tests.

Results

The sample consisted of 364 young poly-substance users (205 males; 56.3%) with a mean age of 19.3 years; 69.8% described their ethnic group as White-European, 12.6% as Black and 10.1% were Asian. Just over a quarter (27.5%) were unemployed at the time of interview; a third were in education, 28.8% were in full-time work and the remainder had part-time employment. Estimates of monthly disposable income (any money that was spare after paying for rent, bills and food) ranged from 0 to over £1000 (median = £250).

Table II. *Profile of substance use over the past year and past 90 days* (n = 364)

Substance (lifetime users)	Lifetime users consuming in past year (%)	Lifetime users consuming in past 90 days (%)	Mean days used in past 90 days (range)	Average amount on typical using day [SD (range)]
Cannabis (n = 350)	98 6	98 3	55 2 (1–90)	1 9[a] (1 49; 0 11–10.7)[d]
Amphetamines (n = 188)	87 8	79 3	7 7 (1–70)	0 9[a] (0 54; 0 02–2 5)
Ecstasy (n = 177)	93 8	87 6	9 0 (1–51)	1 7[b] (1 07, 0 5–5 0)
LSD (n = 91)	68 1	50 5	5.3 (1–39)	1 3[b] (0 67; 0 5–4 0)
Cocaine (n = 184)	93.5	85 3	11 3 (1–80)	0 8[a] (0 53; 0 01–3 5)
Alcohol (n = 327)	95 4	94 5	39 7 (1–90)	9 8[c] (6.74; 0 5–42 0)[e]

[a]Grams.
[b]Number of tablets.
[c]Number of units (1 unit = 8 g ethanol approx.).
[d]One respondent reported smoking 21.3 g of cannabis on a typical using day. This outlying value was recoded to the next highest intensity recorded (10.65 g).
[e]Two alcohol users reported consuming 48 0 and 50 0 units of alcohol on a typical using day respectively. These outlying values were recoded to the next highest intensity recorded in the sample (42 0 units per day) to ensure a more representative measure of mean intensity.

Substance use history

The drug with the highest lifetime prevalence was cannabis (96.2%). This was followed by amphetamine sulphate (51.6%), cocaine hydrochloride (50.5%) (referred to as cocaine hereafter) and ecstasy (48.6%). Twenty-five per cent of the sample had used LSD and this was more common amongst male participants ($\chi^2_{[1]} = 9.68$, $P < 0.01$). Other drugs used included crack cocaine (25.5%), heroin (12.6%), tranquillizers (21.7%) and hallucinogenic mushrooms (8.0%). On average, participants had used a total of 5.2 different psychoactive substances in their lives (out of a possible 14) (median = 4.0, mode = 3.0, range 2–14). There was no gender difference in the number of different drugs ever used.

Table II profiles use of the six target drugs over the past year, and the frequency and intensity of use in the 90 days prior to interview.

There were no gender differences in drug use over the past year or in the past 90 days with the exception of amphetamines. For this substance, females who had ever used this drug were more likely to have done so during the past 90 days than males ($\chi^2_{[1]} = 4.14$, $P < 0.05$). The mean number of target drugs used over the past 90 days was 3.2 (median = 3.0, mode = 3.0, range 2–6). No gender differences were observed. Few differences were also observed in the frequency and intensity of use. Males reported drinking alcohol more frequently during the three months prior to interview ($t_{[307]} = 2.48$, $P < 0.05$) and using cannabis more intensively on a 'typical using day' ($t_{[337]} = 3.56$, $P < 0.001$).

Perceived functions for substance use

There were few differences between the functions endorsed for use of each drug 'ever' and those endorsed for use during 'the year prior to interview'. This section therefore concentrates on data for the year prior to interview. We considered that in order to use a drug for a specific function, the user must have first hand knowledge of the drug's effects before making this decision. Consequently, functions reported by individuals who had only used a particular substance on one occasion in their lives (i.e. with no prior experience of the drug at the time they made the decision to take it) were excluded from the analyses. Table III summarizes the proportion of the sample who endorsed each of the functions for drugs used in the past year. Roman numerals have been used to

Table III. *Proportion (%) of those who have used [substance] more than once who endorsed each functional statement for their use in the past year*

Used [substance] to...	Cannabis (n = 345)	Amphetamines (n = 160)	Ecstasy (n = 357)	LSD (n = 58)	Cocaine (n = 168)	Alcohol (n = 312)
Make yourself feel better when down or depressed (FEEL BETTER)[a]	69.0	43 1	48.4	20.7	61 9	69.9
Help you 'keep going' on a night out with friends (KEEP GOING)	35.9	95.6[i]	91.1[i]	58 6[iv]	84.5[i]	66.7[iv]
Help you feel elated or euphoric (ELATED/EUPHORIC)	46.1	60.6[iv]	77.7[iii]	72 4[ii]	57 1[iv]	51.3
Just get really stoned or intoxicated (INTOXICATED)	90.7[ii]	55.0[v]	68.2[v]	77.6[i]	66 1[iii]	89.1[i]
Help you lose weight (LOSE WEIGHT)	–	23.1	7.0	–	6.0	–
Help you enjoy the company of your friends (ENJOY COMPANY)	66 4	58 1	63.1	58 6[v]	61.3[v]	74 0[iii]
Help you to relax (RELAX)	96.8[i]	13.1	29.9	17.2	28 6	82.7[iii]
Help you feel more confident or more able to talk to people in a social situation (INCREASE CONFIDENCE)	36.5	53.1	42 0	10 3	66 1	70.2[v]
Improve the effects of other substances (IMPROVE EFFECTS)	44.3	37 5	27.4	29.3	26 2	41 0
Help ease the after effects of other substances (AFTER EFFECTS)	64 6	11.9	8.3	3 4	12.5	35 9
Help you to stay awake (STAY AWAKE)	7.5	91.3[ii]	72.0[iv]	50.0	69 0[ii]	10 6
Help you lose your inhibitions (LOSE INHIBITIONS)	28.1	41.9	49.7	36.2	41.1	51.0
Enhance feelings when having sex (ENHANCE SEX)	27.8	31.9	63.1	25.9	52 4	32 1
Help you stop worrying about a problem (STOP WORRYING)	57.7	22.5	32.5	15.5	41.7	55.1
Help make something you were doing less boring (DECREASE BOREDOM)	70.1[v]	45 6	36.3	44 8	53 6	60.6
Help you to sleep (SLEEP)	69.6[iv]	–	–	–	–	30 4
Help you to concentrate or to work or study (WORK)	20.9	29.4	3.2	1.7	6 0	6 4
Enhance an activity such as listening to music or playing a game or sport (ENHANCE ACTIVITY)	72.8[iii]	66.2[iii]	79.6[ii]	72.4[iii]	60.7	51 6
Total number of items in the scale	17	17	17	16	17	17
Chronbach's α for scale items	0.78	0.74	0.76	0.73	0 78	0.84
Mean total number of different functions endorsed for use of [substance] (range)	9.0 (0–17)	7 8 (0–16)	8 0 (0–16)	5.9 (0–15)	7.9 (0–17)	8 8 (0–17)

[a]Abbreviations for these items shown in brackets are used in the text of this paper.
[i–v]Indication of rank according to item scores on Likert scales.

indicate the functions with the top five average scores. Table III also shows means for the total number of different items endorsed by individual users and the internal reliability of the function scales for each substance using Chronbach's α coefficients. There were no significant gender differences in the total number of functions endorsed for any of the six substances.

The following sections summarize the top five most popular functions drug-by-drug together with any age or gender differences observed in the items endorsed.

Cannabis use (n = 345)

Overall the most popular functions for cannabis use were to 'RELAX' (endorsed by 96 8% of people who had used the drug in the last year), to become 'INTOXICATED' (90.7%) and to 'ENHANCE ACTIVITY' (72.8%). Cannabis was also commonly used to 'DECREASE BOREDOM' (70.1%) and to 'SLEEP' (69.6%) [this item was closely followed by using to help 'FEEL BETTER' (69.0%)]. Nine of the 17 function items were endorsed by over half of those who had used cannabis on more than one occasion in the past year. There were no significant gender differences observed, with the exception of using to 'KEEP GOING', where male participants were significantly more likely to say that they had used cannabis to fulfil this function in the past year ($\chi^2_{[1]} = 6.10$, $P < 0.05$).

There were statistically significant age differences on four of the function variables: cannabis users who reported using this drug in the past year to help feel 'ELATED/EUPHORIC' or to help 'SLEEP' were significantly older than those who had not used cannabis for these purposes (19.6 versus 19.0; $t_{[343]} = 3.32$, $P < 0.001$; 19.4 versus 19.0; $t_{[343]} = 2.01$, $P < 0.05$). In contrast, those who had used cannabis to 'INCREASE CONFIDENCE' and to 'STOP WORRYING' tended to be younger than those who did not (19.0 versus 19.4; $t_{[343]} = -2.26$, $P < 0.05$; 19.1 versus 19.5; $t_{[343]} = -1.99$, $P < 0.05$).

Amphetamines (n = 160)

Common functions for amphetamine use were to 'KEEP GOING' (95.6%), to 'STAY AWAKE' (91.3%) or to 'ENHANCE ACTIVITY' (66.2%). Using to help feel 'ELATED/EUPHORIC' (60 6%) and to 'ENJOY COMPANY' (58.1%) were also frequently mentioned. Seven of the 17 function items were endorsed by over half of participants who had used amphetamines in the past year. As with cannabis, gender differences were uncommon: females were more likely to use amphetamines to help 'LOSE WEIGHT' than male participants ($\chi^2_{[1]} = 21.67$, $P < 0.001$).

Significant age differences were found on four function variables. Individuals who reported using amphetamines in the past year to feel 'ELATED/EUPHORIC' were significantly older than those who did not (19.9 versus 19.0; $t_{[158]} = 2.87$, $P < 0.01$). In contrast, participants who used amphetamines to 'STOP WORRYING' (18.8 versus 19.8; $t_{[158]} = -2.77$, $P < 0.01$), to 'DECREASE BOREDOM' (19.2 versus 19.9; $t_{[158]} = -2.39$, $P < 0.05$) or to 'ENHANCE ACTIVITY' (19.3 versus 20.1; $t_{[158]} = -2.88$, $P < 0.01$) were younger than those who had not.

Ecstasy (n = 157)

The most popular five functions for using ecstasy were similar to those for amphetamines. The drug was used to 'KEEP GOING' (91.1%), to 'ENHANCE ACTIVITY' (79.6%), to feel 'ELATED/EUPHORIC' (77.7%), to 'STAY AWAKE' (72.0%) and to get 'INTOXICATED' (68.2%). Seven of the 17 function items were endorsed by over half of those who had used ecstasy in the past year. Female users were more likely to use ecstasy to help 'LOSE WEIGHT' than male participants (Fishers exact test, $P < 0.001$).

As with the other drugs discussed above, participants who reported using ecstasy to feel 'ELATED/EUPHORIC' were significantly older than those who did not (19.8 versus 18.9; $t_{[155]} = 2.61$, $P < 0.01$). In contrast, those who had used ecstasy to 'FEEL BETTER' (19 3 versus 20 0; $t_{[155]} = -2.29$, $P < 0.05$), to 'INCREASE CONFIDENCE' (19.2 versus 19.9; $t_{[155]} = -2.22$, $P < 0.05$) and to 'STOP WORRYING' (19 0 versus 19.9; $t_{[155]} = -2.96$, $P < 0.01$) tended to be younger.

LSD ($n = 58$)

Of the six target substances examined in this study, LSD was associated with the least diverse range of functions for use. All but two of the function statements were endorsed by at least some users, but only five were reported by more than 50%. The most common purpose for consuming LSD was to get 'INTOXICATED' (77.6%). Other popular functions included to feel 'ELATED/EUPHORIC' and to 'ENHANCE ACTIVITY' (both endorsed by 72.4%), and to 'KEEP GOING' and to 'ENJOY COMPANY' (both endorsed by 58.6%). Unlike the other substances examined, no gender or age differences were observed.

Cocaine ($n = 168$)

In common with ecstasy and amphetamines, the most widely endorsed functions for cocaine use were to help 'KEEP GOING' (84.5%) and to help 'STAY AWAKE' (69.0%). Consuming cocaine to 'INCREASE CONFIDENCE' and to get 'INTOXICATED' (both endorsed by 66.1%) were also popular. However, unlike the other stimulant drugs, 61.9% of the cocaine users reported using to 'FEEL BETTER'. Ten of the 17 function items were endorsed by over half of those who had used cocaine in the past year.

Gender differences were more common amongst functions for cocaine use than the other substances surveyed. More males reported using cocaine to 'IMPROVE EFFECTS' of other drugs ($\chi^2_{[1]} = 4.00$, $P < 0.05$); more females used the drug to help 'STAY AWAKE' ($\chi^2_{[1]} = 12.21$, $P < 0.001$), to 'LOSE INHIBITIONS' ($\chi^2_{[1]} = 9.01$, $P < 0.01$), to 'STOP WORRYING' ($\chi^2_{[1]} = 8.11$, $P < 0.01$) or to 'ENJOY COMPANY' of friends ($\chi^2_{[1]} = 4.34$, $P < 0.05$). All participants who endorsed using cocaine to help 'LOSE WEIGHT' were female.

Those who had used cocaine to 'FEEL BETTER' (18.9 versus 19.8; $t_{[166]} = -3.06$, $P < 0.01$), to 'STOP WORRYING' (18.6 versus 19.7; $t_{[166]} = -3.86$, $P < 0.001$) or to 'DECREASE BOREDOM' (18.9 versus 19.6; $t_{[166]} = -2.52$, $P < 0.05$) were significantly younger than those who did not endorse these functions. Similar to the other drugs, participants who had used cocaine to feel 'ELATED/EUPHORIC' in the past year tended to be older than those who had not (19.6 versus 18.7; $t_{[166]} = 3.16$, $P < 0.01$).

Alcohol ($n = 312$)

The functions for alcohol use were the most diverse of the six substances examined. Like LSD, the most commonly endorsed purpose for drinking was to get 'INTOXICATED' (89.1%). Many used alcohol to 'RELAX' (82.7%), to 'ENJOY COMPANY' (74.0%), to 'INCREASE CONFIDENCE' (70.2%) and to 'FEEL BETTER' (69.9%). Overall, 11 of the 17 function items were endorsed by over 50% of those who had drunk alcohol in the past year. Male participants were more likely to report using alcohol in combination with other drugs either to 'IMPROVE EFFECTS' of other drugs ($\chi^2_{[1]} = 4.56$, $P < 0.05$) or to ease the 'AFTER EFFECTS' of other substances ($\chi^2_{[1]} = 7.07$, $P < 0.01$). More females than males reported that they used alcohol to 'DECREASE BOREDOM' ($\chi^2_{[1]} = 4.42$, $P < 0.05$).

t-tests revealed significant age differences on four of the function variables: those who drank to feel 'ELATED/EUPHORIC' were significantly older (19.7 versus 19.0; $t_{[310]} = 3.67$, $P < 0.001$) as were individuals who drank to help them to 'LOSE INHIBITIONS' (19.6 versus 19.0; $t_{[310]} = 2.36$, $P < 0.05$). In contrast, participants who reported using alcohol just to get 'INTOXICATED' (19.2 versus 20.3; $t_{[310]} = -3.31$, $P < 0.001$) or to 'DECREASE BOREDOM' (19.2 versus 19.6; $t_{[310]} = -2.25$, $P < 0.05$) were significantly younger than those who did not.

Combined functional drug use

The substances used by the greatest proportion of participants to 'IMPROVE EFFECTS' from other drugs were cannabis (44.3%), alcohol (41.0%) and amphetamines (37.5%). It was also common to use cannabis (64.6%) and to a lesser extent alcohol (35.9%) in combination with other drugs in order to help manage 'AFTER EFFECTS'. Amphetamines, ecstasy, LSD and cocaine were also used for these purposes, although to a lesser extent. Participants who endorsed the combination drug use items were asked to list the three main drugs with which they had combined the target substance for these purposes. Table IV summarizes these responses.

Table IV. *Combined functional substance use reported by the sample over the past year*

	Cannabis ($n = 153$)	Amphetamines ($n = 60$)	Ecstasy ($n = 43$)	LSD ($n = 17$)	Cocaine ($n = 44$)	Alcohol ($n = 128$)
Used with [substance] to improve its effects						
cannabis	–	16	18	8	14	93
amphetamines	37	–	20	7	3	29
ecstasy	55	39	–	11	19	45
LSD	24	10	9	–	3	6
cocaine	42	4	5	1	–	45
alcohol	110	38	23	4	29	–
hallucinogenic mushrooms	2	0	0	1	0	1
	Cannabis ($n = 223$)	**Amphetamines ($n = 19$)**	**Ecstasy ($n = 15$)**	**LSD ($n = 3$)**	**Cocaine ($n = 23$)**	**Alcohol ($n = 112$)**
Used to help ease after effects of [substance]						
cannabis	–	5	2	0	4	18
amphetamines	83	–	6	1	1	47
ecstasy	114	7	–	3	10	59
LSD	29	0	5	–	0	13
cocaine	80	1	1	0	–	34
alcohol	70	18	7	0	14	–

Overall functions for drug use

In order to examine which functions were most popular overall, a dichotomous variable was created for each different item to indicate if one or more of the six target substances had been used to fulfil this purpose during the year prior to interview. For example, if an individual reported that they had used cannabis to relax, but their use of ecstasy, amphetamines and alcohol had not fulfilled this function, then the variable for 'RELAX' was scored '1'. Similarly if they had used all four of these substances to help them to relax in the past year, the variable would again be scored as '1'. A score of '0' indicates that none of the target substances had been used to fulfil a particular function. Table V summarizes the data from these new variables.

Over three-quarters of the sample had used at least one target substance in the past year for 11 out of the 18 functions listed. The five most common functions for substance use overall were to 'RELAX' (96.7%); 'INTOXICATED' (96.4%); 'KEEP GOING' (95.9%); 'ENHANCE ACTIVITY' (88.5%) and 'FEEL BETTER' (86.8%). Despite the fact that 'SLEEP' was only relevant to two substances (alcohol and cannabis), it was still endorsed by over 70% of the total sample. Using to 'LOSE WEIGHT' was only relevant to the stimulant drugs (amphetamines, ecstasy and cocaine), yet was endorsed by 17.3% of the total sample (almost a third of all female participants). Overall, this was the least popular function for recent substance use, followed by 'WORK' (32.1%). All other items were endorsed by over 60% of all participants.

Gender differences were identified in six items. Females were significantly more likely to have endorsed the following: using to 'INCREASE CONFIDENCE' ($\chi^2_{[1]} = 4.41$, $P < 0.05$); 'STAY AWAKE' ($\chi^2_{[1]} = 5.36$, $P < 0.05$), 'LOSE INHIBITIONS' ($\chi^2_{[1]} = 4.48$, $P < 0.05$), 'ENHANCE SEX' ($\chi^2_{[1]} = 5.17$, $P < 0.05$) and 'LOSE WEIGHT' ($\chi^2_{[1]} = 29.6$, $P < 0.001$). In contrast,

Table V. *Percentage of participants who reported having used at least one of the target substances to fulfil each of the different functions over the past year* (n = 364)

Used at least one target substance to...	Male (%) (*n* = 205)	Female (%) (*n* = 159)	Total (%) (*n* = 364)	χ^2
1. RELAX	96.1	97 5	96.7	0 54
2 INTOXICATED	96 1	96 9	96 4	0.15
3. KEEP GOING	95 6	96 2	95 9	0 09
4 ENHANCE ACTIVITY	90 2	86 2	88.5	1.46
5. FEEL BETTER	84 9	89 3	86 8	1.54
6 ENJOY COMPANY	83.4	86.2	84 6	0.52
7 DECREASE BOREDOM	82 0	84 3	83.0	0.34
8 INCREASE CONFIDENCE	79 0	87.4	82.7	4.41[a]
9 STAY AWAKE	78 0	87.4	82 1	5.36[a]
10 FEEL ELATED/EUPHORIC	77 1	74 2	75 8	0.40
11. STOP WORRYING	71.7	79 9	75 3	3 21
12. SLEEP	73.7	67 9	71 2	1 43
13. AFTER EFFECTS	71.2	65.4	68 7	1 41
14 LOSE INHIBITIONS	62.4	73 0	67.0	4 48[a]
15. ENHANCE SEX	57 6	69 2	62 6	5 17[a]
16. IMPROVE EFFECTS	65 9	48 4	58 2	11.18[c]
17. WORK	33.7	30 2	32.1	0.49
18. LOSE WEIGHT	7 8	29 6	17 3	29 6[c]

[a]$P < 0.05$, [b]$P < 0.01$; [c]$P < 0.001$.

males were more likely to use a substance to 'IMPROVE EFFECTS' of another drug ($\chi^2_{[1]} = 11.18$, $P < 0.001$).

Statistically significant age differences were identified in three of the items. Those who had used at least one of the six target substances in the last year to feel 'ELATED/EUPHORIC' (19.5 versus 18.6; $t_{[362]} = 4.07$, $p = 0.001$) or to 'SLEEP' (19.4 versus 18.9; $t_{[362]} = 2.19$, $p = 0.05$) were significantly older than those who had not used for this function. In contrast, participants who had used in order to 'STOP WORRYING' tended to be younger (19.1 versus 19.7; $t_{[362]} = -2.88$, $p = 0.005$).

Discussion

This paper has examined psychoactive substance use amongst a sample of young people and focused on the perceived functions for use using a 17-item scale. In terms of the characteristics of the sample, the reported lifetime and recent substance use was directly comparable with other samples of poly-drug users recruited in the UK [e.g. (Release, 1997)].

Previous studies which have asked users to give reasons for their 'drug use' overall instead of breaking it down by drug type [e.g. (Carman, 1979; Butler *et al.*, 1981; Newcomb *et al.*, 1988; Cato, 1992; McKay *et al.*, 1992)] may have overlooked the dynamic nature of drug-related decision making. A key finding from the study is that that with the exception of two of the functions for use scale items (using to help sleep or lose weight), all of the six drugs had been used to fulfil all of the functions measured, despite differences in their pharmacological effects. The total number of functions endorsed by individuals for use of a particular drug varied from 0 to 15 for LSD, and up to 17 for cannabis, alcohol and cocaine. The average number ranged from 5.9 (for LSD) to 9.0 (for cannabis). This indicates that substance use served multiple purposes for this sample, but that the functional profiles differed between the six target drugs.

We have previously reported (Boys *et al.*, 2000b) that high scores on a cocaine functions scale are strongly predictive of high scores on a cocaine-related problems scale. The current findings support the use of similar function scales for cannabis, amphetamines, LSD and ecstasy. It remains to be seen whether similar associations with problem scores exist. Future developmental work in this area should ensure that respondents are given the opportunity to cite additional functions to those included here so that the scales can be further extended and refined.

Recent campaigns that have targeted young people have tended to assume that hallucinogen and stimulant use is primarily associated with dance events, and so motives for use will relate to this context. Our results support assumptions that these drugs are used to enhance social interactions, but other functions are also evident. For example, about a third of female interviewees had used a stimulant drug to help them to lose weight. Future education and prevention efforts should take this diversity into account when planning interventions for different target groups.

The finding that the same functions are fulfilled by use of different drugs suggests that at least some could be interchangeable. Evidence for substituting alternative drugs to fulfil a function when a preferred drug is unavailable has been found in other studies [e.g. (Boys *et al.*, 2000a)]. Prevention efforts should perhaps focus on the general motivations behind use rather than trying to discourage use of specific drug-types in isolation. For example, it is possible that the focus over the last decade on ecstasy prevention may have contributed inadvertently to the rise in cocaine use amongst young people in the UK (Boys *et al.*, 1999c). It is important that health educators do not overlook this possibility when developing education and prevention initiatives. Considering functions that substance use can fulfil for young people could help us to understand which drugs are likely to be interchangeable. If prevention programmes were designed to target a range of substances that commonly fulfil similar functions, then perhaps this could address the likelihood that some young people will substitute other drugs if deterred from their preferred substance.

There has been considerable concern about the perceived increase in the number of young people who are using cocaine in the UK (*Tackling Drugs to Build a Better Britain*, 1998; Ramsay and Partridge, 1999; Boys *et al.*, 2000b). It has been suggested that, for a number of reasons, cocaine may be replacing ecstasy and amphetamines as the stimulant of choice for some young people (Boys *et al.*, 1999c). The results from this study suggest that motives for cocaine use are indeed similar to those for ecstasy and amphetamine use, e g. using to 'keep going' on a night out with friends, to 'enhance an activity', 'to help to feel elated or euphoric' or to help 'stay awake'. However, in addition to these functions which were shared by all three stimulants, over 60% of cocaine users reported that they had used this drug to 'help to feel more confident' in a social situation and to 'feel better when down or depressed'. Another finding that sets cocaine aside from ecstasy and amphetamines was the relatively common existence of gender differences in the function items endorsed. Female cocaine users were more likely to use to help 'stay awake', 'lose inhibitions', 'stop worrying', 'enjoy company of friends' or to help 'lose weight'. This could indicate that women are more inclined to admit to certain functions than their male counterparts. However, the fact that similar gender differences were not observed in the same items for the other five substances, suggests this interpretation is unlikely. Similarly, the lack of gender differences in patterns of cocaine use (both frequency and intensity) suggests that these differences are not due to heavier cocaine use amongst females. If these findings are subsequently confirmed, this could point towards an inclination for young women to use cocaine as a social support, particularly to help feel less inhibited in social situations. If so, young female cocaine users may be more vulnerable to longer-term cocaine-related problems.

Many respondents reported using alcohol or cannabis to help manage effects experienced from another drug. This has implications for the choice

of health messages communicated to young people regarding the use of two or more different substances concurrently. Much of the literature aimed at young people warns them to avoid mixing drugs because the interactive effects may be dangerous [e.g. (HIT, 1996)]. This 'Just say No' type of approach does not take into consideration the motives behind mixing drugs. In most areas, drug education and prevention work has moved on from this form of communication. A more sophisticated approach is required, which considers the functions that concurrent drug use is likely to have for young people and tries to amend messages to make them more relevant and acceptable to this population. Further research is needed to explore the motivations for mixing different combinations of drugs together.

Over three-quarters of the sample reported using at least one of the six target substances to fulfil 11 out of the 18 functions. These findings provide strong evidence that young people use psychoactive drugs for a range of distinct purposes, not purely dependent on the drug's specific effects. Overall, the top five functions were to 'help relax', 'get intoxicated', 'keep going', 'enhance activity' and 'feel better'. Each of these was endorsed by over 85% of the sample. Whilst all six substances were associated to a greater or lesser degree with each of these items, there were certain drugs that were more commonly associated with each. For example, cannabis and alcohol were popular choices for relaxation or to get intoxicated. In contrast, over 90% of the amphetamine and ecstasy users reported using these drugs within the last year to 'keep going'. Using to enhance an activity was a common function amongst users of all six substances, endorsed by over 70% of ecstasy, cannabis and LSD users. Finally, it was mainly alcohol and cannabis (and to a lesser extent cocaine) that were used to 'feel better'.

Several gender differences were observed in the combined functions for recent substance use. These findings indicate that young females use other drugs as well as cocaine as social supports. Using for specific physical effects (weight loss, sex or wakefulness) was also more common amongst young women. In contrast, male users were significantly more likely to report using at least one of the target substances to try to improve the effects of another substance. This indicates a greater tendency for young males in this sample to mix drugs than their female counterparts. Age differences were also observed on several function items: participants who had used a drug to 'feel elated or euphoric' or to 'help sleep' tended to be older and those who used to 'stop worrying about a problem' were younger. If future studies confirm these differences, education programmes and interventions might benefit from tailoring their strategies for specific age groups and genders. For example, a focus on stress management strategies and coping skills with a younger target audience might be appropriate.

Some limitations of the study need to be acknowledged. The sample for this study was recruited using a snowball-sampling methodology. Although it does not yield a random sample of research participants, this method has been successfully used to access hidden samples of drug users [e.g. (Biernacki, 1986; Lenton *et al.*, 1997)]. Amongst the distinct advantages of this approach are that it allows theories and models to be tested quantitatively on sizeable numbers of subjects who have engaged in a relatively rare behaviour.

Further research is now required to determine whether our observations may be generalized to other populations (such as dependent drug users) and drug types (such as heroin, tranquillizers or tobacco) or if additional function items need to be developed. Future studies should also examine if functions can be categorized into primary and subsidiary reasons and how these relate to changes in patterns of use and drug dependence. Recognition of the functions fulfilled by substance use could help inform education and prevention strategies and make them more relevant and acceptable to the target audiences.

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References

Biernacki, P. (1986) *Pathways from Heroin Addiction. Recovery without Treatment*. Temple University Press, Philadelphia, PA.

Boys, A., Marsden, J., Griffiths, P., Fountain, J., Stillwell, G. and Strang, J. (1999a) Substance use among young people: the relationship between perceived functions and behavioural intentions. *Addiction*, 94, 1043–1050

Boys, A., Marsden, J., Fountain, J., Griffiths, P., Stillwell, G. and Strang, J. (1999b) What influences young people's use of drugs? A qualitative study of decision-making *Drugs: Education, Prevention and Policy*, 6, 373–389.

Boys, A., Marsden, J. and Griffiths, P. (1999c) Reading between the lines: is cocaine becoming the stimulant of choice for urban youth? *Druglink*, 14, 20–23.

Boys, A., Fountain, J., Marsden, J., Griffiths, P., Stillwell, G. and Strang, J. (2000a) *Drug Decisions: A Qualitative Study of Young People, Drugs and Alcohol*. Health Education Authority, London.

Boys, A., Marsden, J., Griffiths, P. and Strang, J. (2000b) Drug use functions predict cocaine-related problems. *Drug and Alcohol Review*, 19, 181–190.

Butler, M. C., Gunderson, E. K. E. and Bruni, J. R. (1981) Motivational determinants of illicit drug use: an assessment of underlying dimensions and their relationship to behaviour. *International Journal of the Addictions*, 16, 243–252.

Carman, R. S. (1979) Motivations for drug use and problematic outcomes among rural junior high school students *Addictive Behaviors*, 4, 91–93.

Cato, B. M. (1992) Youth's recreation and drug sensations: is there a relationship? *Journal of Drug Education*, 22, 293–301.

Edwards, G., Chandler, J. and Peto, J. (1972) Motivation for drinking among men in a London suburb. *Psychological Medicine*, 2, 260–271.

European Monitoring Centre for Drugs and Drug Addiction (1998) *Annual Report on the State of the Drugs Problem in the European Union*. EMCDDA, Lisbon.

Griffiths, P., Gossop, M., Powis, B. and Strang, J. (1993) Reaching hidden populations of drug users by privileged access interviewers: methodological and practical issues. *Addiction*, 88, 1617–1626.

HIT (1996) *Chill Out: A Clubber's Guide—The Second Coming*. HIT, Liverpool.

Johnston, L. D., O'Malley, P. M. and Bachman J. G. (1997) *National Survey Results on Drug Use from the Monitoring the Future Study, 1975–1996. Secondary School Students*. US DHHS, National Institute on Drug Abuse, Rockville, MD

Johnston, L. D., O'Malley, P. M. and Bachman J. G. (2000) *The Monitoring the Future National Results on Adolescent Drug Use. Overview of Key Findings 1999*. US DHHS, National Institute on Drug Abuse, Rockville, MD.

Lenton, S., Boys, A. and Norcross, K. (1997) Raves, drugs and experience: drug use by a sample of people who attend raves in Western Australia. *Addiction*, 92, 1327–1337.

Marsden, J., Gossop, M., Stewart, D., Best, D., Farrell, M., Edwards, C., Lehmann, P. and Strang, J. (1998) The Maudsley Addiction Profile (MAP): a brief instrument for assessing treatment outcome *Addiction*, 93, 1857–1867.

McKay, J. R., Murphy, R. T., McGuire, J., Rivinus, T. R. and Maisto, S. A. (1992) Incarcerated adolescents' attributions for drug and alcohol use *Addictive Behaviors*, 17, 227–235.

Newcomb, M. D., Chou, C.-P., Bentler, P. M. and Huba, G. J. (1988) Cognitive motivations for drug use among adolescents: longitudinal tests of gender differences and predictors of change in drug use. *Journal of Counselling Psychology*, 35, 426–438.

Power, R. (1995) A model for qualitative action research amongst illicit drug users *Addiction Research*, 3, 165–181

Power, R., Power, T. and Gibson, N. (1996) Attitudes and experience of drug use amongst a group of London teenagers. *Drugs: Education, Prevention and Policy*, 3, 71–80.

Ramsay, M. and Partridge, S. (1999) *Drug Misuse Declared in 1998: Results from the British Crime Survey* Home Office, London.

Release (1997) *Release Drugs and Dance Survey: An Insight into the Culture*. Release, London.

Sadava, S. (1975) Research approaches in illicit drug use: a critical review. *Genetic Psychology Monographs*, 91, 3–59.

Tackling Drugs to Build a Better Britain (1998) *The Government's 10-year Strategy on Drug Misuse*. Central Drugs Co-ordinating Unit, London.

Van Meter, K. M. (1990) Methodological and design issues: techniques for assessing the representatives of snowball samples. In Lambert, E. Y. (ed.), *The Collection and Interpretation of Data from Hidden Populations*. US DHHS, National Institute on Drug Abuse, Rockville MD, pp. 31–33.

Wibberley, C. and Price, J. (2000) Patterns of psycho-stimulant drug use amongst 'social/operational users': implications for services. *Addiction Research*, 8, 95–111.

WHO (1997) *Amphetamine-type Stimulants: A Report from the WHO Meeting on Amphetamines, MDMA and other Psychostimulants Geneva, 12–15 November 1996*. Programme on Substance Abuse, Division of Mental Health and Prevention of Substance Abuse, WHO, Geneva.

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